

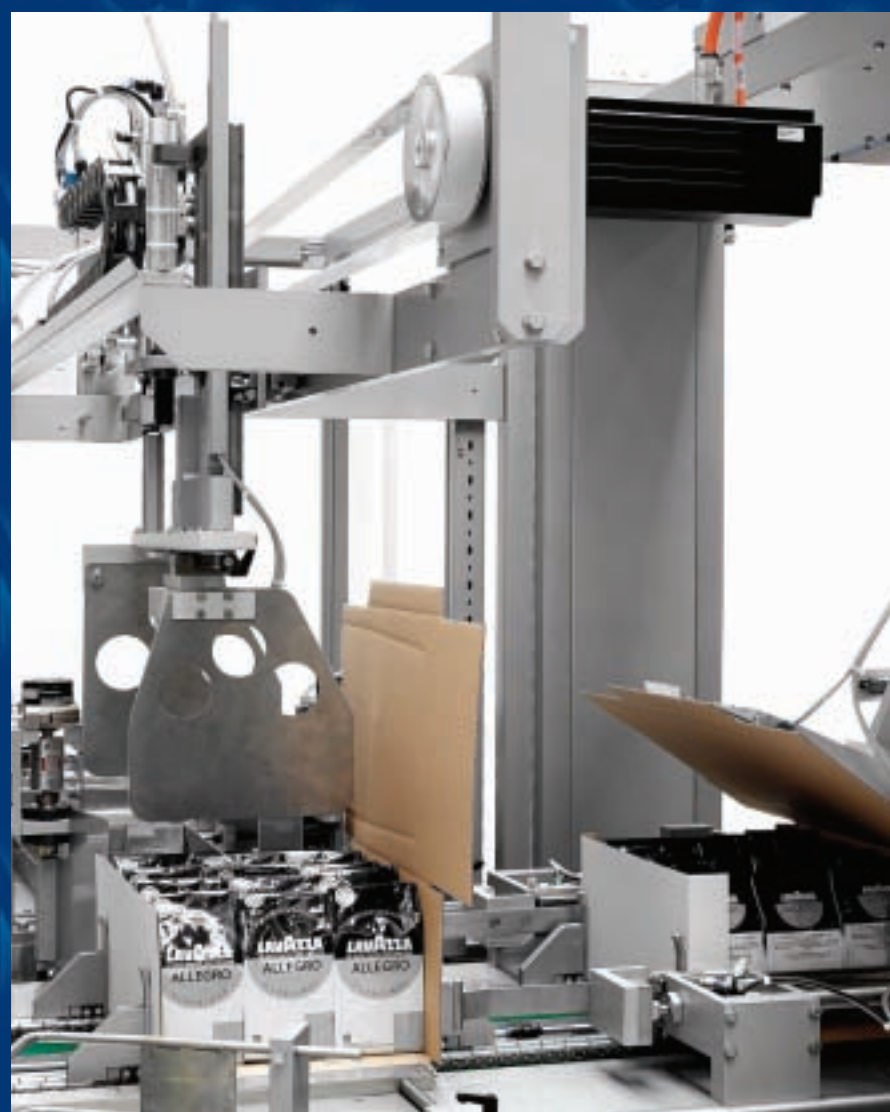
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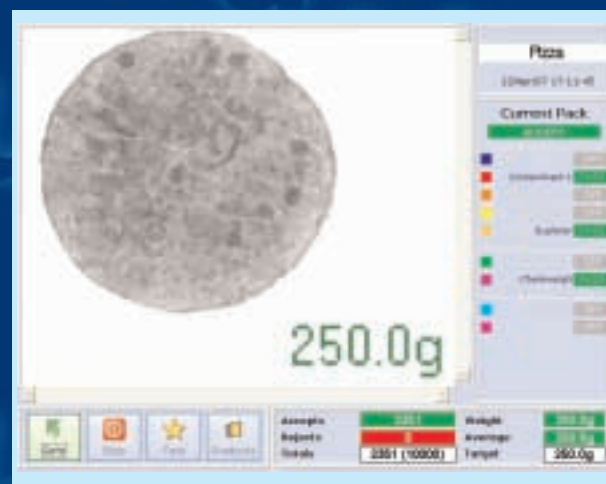
# Machinery

## UPDATE

The only 'machinery only' journal for processing and packaging



RETAIL READY PACKAGING



CHECKWEIGHING  
**X-weigh or  
checkweigh?**



MIXING  
**Creating the  
perfect blend**

# Flexibility rules the options

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ISSUE 5, VOLUME XVIII. SEPTEMBER/OCTOBER 2007

## Machinery UPDATE

THE JOURNAL OF THE PPMA

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# The information mix

Given the extent to which our business lives seem dominated by the internet, e-mail and other forms of electronic communications media – webinars and Global Skype conferencing to name just a couple – it's a comfort to reflect how remarkably robust, and useful, the more traditional forms of media and communication are still proving to be.

Business-to-business magazines, directories and trade shows remain just as much a part of the 'information mix' as ever before – as well, of course, as training courses and seminars. What has changed is that, increasingly, a more sophisticated audience is learning which parts of that mix sit most readily with the job at hand.



Over the years the PPMA has responded to the needs of the machinery world with a series of improvements to its web site – in July, for example, recording more than 76,000 visits – and also to the machinery finder service. But at the same time the Association has moved ahead on many other fronts, particularly with extended programmes of training for both users and suppliers of machinery.

Our magazine *Machinery Update* now attends many more European events, bringing readers news of the latest developments that surface for the first time at Continental shows. Then there is the PPMA Show itself which, next year, will offer visitors the benefit of a major programme of seminars that they can attend for free.

Which part of the information mix buyers of machinery find attractive will clearly depend on circumstances. The written word is still probably the best alerting service on what's new and who's using what. Web sites don't drop on your desk and are not edited.

However web sites are best when a decision to purchase a particular type of equipment has been made and more information is required on a select number of potential suppliers.

But without guidance from the PPMA web site – or the *PPMA Machinery Directory* for that matter – it's a jungle, as anyone who has asked Google about conveyors (4.5 million results) or for print and apply labellers (29 million results) will testify.

Used together, the printed word and electronic media provided by the PPMA become a powerful sourcing tool for the machinery buyer. Add in our exhibitions and seminars and the information mix is complete. Individual needs will, of course, determine the proportions.

Even so, all said and done, no internet 'virtual exhibition' or the like can ever provide so much information so quickly and as well as the PPMA Show. I have yet to meet anyone who bought a machine because he or she liked the picture.

In my view it is a fallacy that exhibitions are less important than before. In an age where information is at a premium – but there is usually too much of it – an exhibition is a great place to sift, sort and assimilate information and ideas very quickly. And exhibitions will always be a breeding ground for ideas.

So we hope that you will see the PPMA as an increasingly valuable partner in your business. Whether it's exhibitions, this journal, CE Mark information, web sites or even 'one to one' advice on finding machinery, we are full of ideas to help you navigate your way through the information mix.

*Chris Buxton*

Chief Executive, PPMA

## THE PPMA SHOW

# PPMA Show 2008 builds on success with free seminars

Next year's PPMA Show will include a major free seminar programme for the visitors, show organisers the PPMA and Reed Exhibitions have announced.

"The PPMA Show remains the 'must attend' exhibition for buyers and users of processing and packaging machinery and it continues to attract the single largest gathering of these professionals in the UK," comments Liz Finlay, PPMA Show exhibition director.

"The show always delivers high calibre exhibitors keen to show off their latest developments. Each time, visitors will find machines that are faster, more accurate and more efficient than the time before, reflecting customer



*The PPMA Show: The 'must attend' exhibition for processing and packaging*

demands to maximise production and minimise cost."

Nearly 300 exhibitors from 17 different countries took part in the PPMA Show 2006 and the exhibition attracted a registered visitor attendance of 6,296.

"We will be aiming to build on

the success of the 2006 event, which was characterised by the quality of visitors and the leads that this generated," says Liz Finlay.

The 2008 PPMA Show takes place September 30 to October 2 and is co-located with Interplas.

## ORDERS AND INSTALLATIONS

## Schubert takes £6m orders for bespoke food packing lines

Robotics specialist Schubert has announced over £6 million worth of new orders to provide food manufacturers in the British Isles with bespoke automatic packing lines. These include systems bound for Burton's Foods' Llantarnam bakery in South Wales, Fox's biscuit plant in Batley, Yorkshire, and Cuisine de France's factory in Dublin.

Baker Perkins is to supply Jackson's Bakery, Hull, with a further mixing and forming line to increase output of loaves for sandwich making. The line will include Tweedy dough mixers, Accurist dividers, a conical moulder, intermediate prover and Multitex4 moulders.

## TRAINING

# PPMA training programme looks to safety legislation

The 2007 PPMA seminar and training programme – held in association with MTA and Picon – is resuming after the summer break with three courses on machinery safety and electrical equipment legislation.

**Provision and Use of Work Equipment Regulations** (11 October): This course will help anyone who is responsible for the purchase, use, maintenance or modification of work equipment to gain a thorough understanding of their responsibilities under this legislation and what it does and does not cover.

**New Electromagnetic Compatibility Directive** (22 November): Compared with the

current directive, the new EMC Directive contains significant departures that will have particular impact on companies that combine items of equipment to make fixed installations.

It now applies to components and sub-assemblies as well as electrical apparatus. Procedures for claiming conformity to the Directive have changed, as have the requirements for what was once called the technical construction file.

**Functional safety of control systems** (22 November): The functional safety of control systems is one of the most contentious subjects in CE marking with fierce debates on the relative importance

of circuit architecture, selection of components and the safety integrity of components and systems.

This seminar will discuss the relative merits and likely uses of the different standards and provide practical examples of how they can be applied to conventional hard-wired safety circuits and to software synchronised machines and machines that use safety bus systems, safety PLCs and safety critical software.

For full details of PPMA 2007 training courses and seminars, including discounts for multiple bookings, contact Emma Corney at the PPMA, T: 020 8773 8111, E: emma.corney@ppma.co.uk

## PPMA DIRECTORY

## Machinery details at your fingertips

The 2007-2008 edition of the *PPMA Processing & Packaging Machinery Directory* is now available giving comprehensive details of machinery supplied on the UK market by the Association's 350 members.

Running to 368 pages, the directory includes a full list of PPMA members, with the machinery they build or import.

The index covers over 1200 processing and packaging machinery classifications while there is also an index to more than 1000 trade names and a full guide to the overseas manufacturers represented in the UK by PPMA members.

The directory is available for £45 (including delivery in the UK) from the PPMA (tel: 020 8773 8111, fax: 020 8773 0022, e-mail: publishing@ppma.co.uk).

# Operational excellence - leveraging the value of experience



Operational excellence is the theme for this year's ISPE UK affiliate annual conference in on 15 November, with the proceedings focusing in particular on the value of experience, both internal and external, to the pharmaceutical industry. To give justice to the depth of this topic, the ISPE UK Northwest Region, which is organising the conference, has elected to deliver a two-stream event, allowing 12 papers to be presented.

Morning and afternoon sessions will both start with a keynote paper, and an additional paper, in a single forum. The conference will then divide into project management and engineering technology streams for the balance of the period, so providing professional focus and value. The conference takes place at the Deansgate Hilton Hotel, Manchester, – the tallest building in the UK outside London.

## Conference agenda

**8:00** Registration, coffee and tabletop exhibition

**9:15** Introduction and welcome

Keynote speaker: The quest for operational excellence

*Simon Shelley, vice-president engineering, primary supply, GSK*

Challenges of the Beetham Tower Project

*Phil Lovell, Carillion plc*

**10:45** Mid morning break and tabletop exhibition

### 11:25 Project management

Can we do it faster?

*Trish Melton, MIME Solutions*

Sharing design best practice

*Adrian Barrass, AstraZeneca Engineering*

*Tom Stanway, AstraZeneca Engineering*

**12:45** Lunch and tabletop exhibition

**14:00** In support of excellence

*Bruce Davies, AstraZeneca*

Facility of the year – Wyeth Biotech, Grange Castle

*Jason Hier, Bovis Lend Lease*

**15:20** Afternoon break and tabletop exhibition

### 15:50 Project management

Managing successful shutdowns

*Michael Glass, PICME*

Learning from overseas projects

*Les James, Jacobs Engineering*

**17:15** Close

### Seminar sponsors:

The Austin Co UK, Bovis Lend Lease Technology, CI Electronics, C21C, Currie & Brown, DMN UK, Faithful & Gould, Haden Freeman, Industrial Technology Systems, K Home International, Parker Domnick Hunter, PM Project Services.

### Participants in the tabletop exhibition:

Alpha Laval, Amec Design & Project Services, Ardmac, The Austin Co UK, Bovis Lend Lease, Buck Systems, Buss-SMS-Canzler, Cambridge Fluid Systems, Camfil, CEL International, Christ Water Technology, Complyserve, C21C, Dockweiler UK, Epsilon Pharmservices, Eurotherm, Excelsyn Management Consulting, Fairfield Control Systems, Festo, Foster Wheeler, Freestead Process Technology, Gardner & Theobald, Haden Freeman, Huttlin, ITCM, Industrial Technology Systems, K Home International, Koerber Medipak UK, IWKA Manesty, Matini Biopharm Installations, MRC Systems, Orthos Engineering, Pacpharma Handling Solutions, Parker Domnick Hunter, Pharmadule, PPMA, Roplan, RTS Life Science, Shield Medicare, Siemens Automation & Drives, SRG, Steris, Testo, Thermal Transfer, TTL, Ytron-Quadro (UK), M+W Zander FE UK.

### Engineering technology

Engineering for cleaning

*Phil Shering, AstraZeneca Engineering*

Manufacturing excellence in packaging

*Bruce Paxton, Molins UK*

### Engineering technology

Energy management or sustainability

*Frank Mills, Environmental Design Consultants*

Nanotechnology in pharma

*Dan Gooding, Centre of Process Innovation*

## PEOPLE

### Newman names new engineering director

Pharmaceutical and healthcare labelling specialist

Newman Labelling Systems has appointed **Kevin Triggs** (right) as engineering



director. He has been engineering manager since 1999 and was previously with the company 1987-94 before relocating. **Chris Lindley-Smith** has joined Newman Labelling as European sales manager.

**David Maddern**

has been promoted to sales director at Schubert UK. He joined the company during 2003 as southern area sales executive.



**Mark O'Donnell**

has returned to Weber Marking Systems as national sales manager for the



UK and Ireland. He brings 25 years experience of the coding industry, having begun his career with Markem in 1983.

**Mike Smith** has been appointed sales manager for the PCM (package coding management) business at Claricom.

**Martin Roe** has joined Chronos Richardson as regional sales manager for Scotland and Ireland.

**Dick South**, who was responsible for setting up the UK arm of French end-of-line machinery specialist Cermex,



has retired after 40 years in packaging. He was managing director of Cermex UK for 20 years and, in 2005 was presented with a PPMA Lifetime Achievement Award, recognising his contribution to the machinery industry.

PPMA MEMBERSHIP

# More new members

THE PPMA CONTINUES TO WELCOME NEW MEMBERS FROM ACROSS THE ENTIRE MACHINERY INDUSTRY.

ANDREWS AUTOMATION

## Conveyor range includes system for handling pallets

Midlands-based Andrews Automation designs, manufactures and installs a complete range of conveyors, specialising particularly in handling palletised goods.

One example is the Q89 roller conveyor system for pallets and other heavy items with an even bearing surface.

This is built up from a series of standard modules including non-driven and chain-driven roller conveyors, chain conveyors, chain transfers, turntables, slat conveyors, transfer carts, elevators, and pallet destackers.

Andrews also produces three standard conveyor systems – for light, medium and heavy duty applications – which form the basis of custom solutions with specially developed components and intelligent logistics control systems.  
T: 0845 201 0626  
E: sales@andrewsautomation.com

BRAMIGK &amp; CO

## Confectionery food and pharma machinery for over 130 years

Bramigk & Co has been supplying the confectionery, food, chemical and pharmaceutical industries since 1872 and operates from offices in Chelmsford, Birmingham and Newcastle.

Equipment provided includes bulk storage and powder handling,



**Andrews Automation:** Conveyors include the Q89 pallet handling system

roasting, mixing and homogenising – including laboratory equipment – sieving, forming, depositing and recycling, through to fill-seal and form-fill-seal machinery of various types.

In addition, there is machinery for collating and loading primary packs into outers, display packs, shelf ready packaging or transit packs. Trial facilities are available.

T: 01245 477616  
E: info@bramigk.co.uk

CC AUTOMATION

## Portfolio can link to provide complete packing lines

CC Automation represents a number of Continental European machinery manufacturers whose equipment is complementary and often integrated to provide complete lines for the food, dairy,

personal care, beverage and pharmaceutical industries.

These include Paal Packaging Machinery which builds end-of-line systems, extending from side load case packers to wraparound machines and those able to make two piece shelf ready packs, horizontal and vertical cartoners, multi-packing systems and robotic top loading systems able to create mixed flavour packs.

There is also Lorenz Pan, which manufactures palletising and associated product conveying, pallet handling and pallet wrapping systems, including robotic systems, and low and high level palletisers.

Novapac builds rotary cup filling and inline horizontal thermoforming systems for yoghurts, dips, margarine, ketchup mayonnaise, meat and cheese and electrical components.

Miromatic specialises in larger bucket and drum filling for yoghurt and dairy based drinks as well as

fruit yoghurt mixing systems. Synchrosys makes flow-wrapping and conveying equipment including orientating and aligning units.

T: 01892 544789

E: info@ccautomation.com

D &amp; D ENGINEERING (HULL)

## Conveyors in stainless are aimed at the food industry

D & D Engineering has been building conveyors and conveyor systems for 20 years, initially mostly for food manufacturers in the Humber region but more recently across global markets with the Double D range of conveyors. Stainless steel construction is a speciality.

The D&D conveyor range has expanded and the company now supplies a growing number of equipment manufacturers with ancillary conveyor and product handling equipment.

This includes conveyor and reject systems to complement product inspection equipment and automatic handling and feeding systems for a range of packaging machinery.

T: 01482 879175  
E: info@ddeng.co.uk

DATA LASE

## Laser sensitive print or tape gives coding alternative

The DataLase Packmark process for coding and marking employs a pigmented ink – printed onto



**Kuka:** Full range of robotics

primary and secondary packaging – which is imaged by a low power CO<sub>2</sub> laser to give an indelible code, free from risk of print gain on porous surfaces.

There is also DataLase Casemark tape, in which the pigment is impregnated. The polypropylene tape is cut and fixed into position on the case then imaged through its surface to provide an encased, scuff-free code impervious to damage from chemicals or solvents.

Variable information and bar codes can be handled by the Casemark system, said to reduce consumables cost by 30-50 per cent compared with conventional pressure-sensitive print-apply labelling.

T: 0151 423 9360  
E: info@datalase.com

KUKA AUTOMATION + ROBOTICS

## Four to six axis robots handle payloads from 3 to 1000kg

One of Europe's leading robot manufacturers, Kuka Automation + Robotics has over 85,000 robots in the field and also provides turnkey solutions for a wide variety of automation requirements. Typical applications include machine tending, order picking



**RTS Flexible Systems:** Robotic bread tin handling for Warburtons

and assembly, packaging, and palletising.

Kuka robots are capable of handling payloads from 3 to 1000kg for a broad range of applications, with four-axis Scara to six-axis slim jointed units. All models employ a synergy of control language and architecture.

Engineering services provided by Kuka include 2D and 3D design, robot and system integration, process analysis and cycle time study as well as remote diagnosis via the internet.

T: 0121 585 0800  
E: sales@kuka.co.uk

LONGFORD EUROPE UK

## Feeders link with full range of host machinery

Longford International designs and builds customised friction feeders, bandolier feeders, sachet feeders, 3D premium and desiccant feeders, pile sheet feeders, and rotary pick-and-place feeders.

All can be integrated with any type or make of flow-wrapper, cartoner, vertical form-fill-seal machine, or shrink wrapper, as well as web-fed presses.

Current applications include a number of feeders integrated with bar code scanners, glue systems,

ink jet printers and vision systems for turnkey packages.

T: 07920 113308  
E: jeffs@longfordint.com

OCS CHECKWEIGHERS

## Checkweigher range suits full range of duties

OCS produces a comprehensive range of checkweighers, designed on a modular basis for applications that extend from simple standalone duties to multi-track machines with minimum space between track centres. Speeds up to 600 items a minute can be achieved.

All machines operate on the basis of Electro Magnetic Force Restoration (EMFR) which is said to offer extremely accurate operation over a large weighing range and at high speed.

T: 01865 338028  
E: info.uk@ocs-cw.com

RTS FLEXIBLE SYSTEMS

## Robotic handling systems include product ID and quality control

RTS Flexible Systems specialises in automatic product handling and

packaging applications, offering bespoke solutions that combine the speed and flexibility of vision-guided picking robots with the latest product identification, tracking and quality control techniques.

The company was established in 2001 by the RTS Group to offer the food and FMCG industries its expertise gained during 20 years spent developing industrial robot technology.

Among RTS food industry clients is Warburtons bakery, which recently awarded the company a Supplier's Award at its first ever supplier conference.

RTS was the only engineering company to receive one of four awards in recognition of its "commitment and outstanding contribution" during a 12-year working partnership. RTS has over 25 robotic bread tin handling and storage systems in service at six Warburtons sites.

T: 0161 777 2000  
E: flexible.info@rts-group.com

WIRE BELT CO

## Wire link belts for conveyor transport and handling duties

Wire Belt group is the manufacturer of Flat-Flex belting and also produces a full range of Eye-Flex wire link belts for tougher applications as well as a wide range of other conveyor belts.

In addition, the company's ConveyorTec division produces a diverse range of conveyors which are designed to change product direction, spacing or gapping between processes.

Wire Belt's latest product is Compact Grid, aimed specifically at handling smaller delicate products while providing a lighter weight, open-mesh belt design.

T: 01795 421771  
E: sales@wirebelt.co.uk

# 'Available NOW!' the Brand New PPMA Machinery Directory for 2007-08

## DIARY DATES

**25-27 September:** Fachpack 2007 packaging technology show, held alongside with PrintPack and Logintern packaging production and logistics exhibitions. Nurnberg.  
Details: [www.fachpack.de](http://www.fachpack.de)

**2-4 October:** ICSE 2007, the Pharmaceutical contract services exhibition. Milan.  
Details: CMP Information, +31 346 559444.

**11 October:** PPMA Seminar: Provision and use of work equipment regulations (PUWER). Includes practical advice on how to evaluate safety and to design guarding systems. Marriott Hotel, Northampton.  
Details: John Cowdrey: 020 8773 8111, [john.cowdrey@ppma.co.uk](mailto:john.cowdrey@ppma.co.uk)

**13-17 October:** Anuga food and drink exhibition. Cologne.  
Details: [www.anuga.com](http://www.anuga.com)

**15-17 October:** Pack Expo Las Vegas packaging exhibition. Details: [www.packexpo.com](http://www.packexpo.com)

**24-31 October:** K2007 plastics and plastics processing exhibition. Dusseldorf.  
Details: [www.K-online.de](http://www.K-online.de)

**22 November:** PPMA Seminar on the new Electromagnetic Directive which now applies to

components and sub assemblies as well as electrical apparatus. Marriott Hotel, Northampton.  
Details: John Cowdrey: 020 8773 8111, [john.cowdrey@ppma.co.uk](mailto:john.cowdrey@ppma.co.uk)

**22 November:** PPMA Seminar on functional safety of control systems. Covers the different Standards and provides practical examples of their use. Marriott Hotel, Northampton. Details: John Cowdrey: 020 8773 8111, [john.cowdrey@ppma.co.uk](mailto:john.cowdrey@ppma.co.uk)

## 2008

**13-14 February:** IPOT photonics and optical technology, machine vision and displays technology show. NEC Birmingham.  
Details [www.ipot.co.uk](http://www.ipot.co.uk)

**13-14 February:** Machine building, drives and automation exhibition, incorporating pneumotion air at work show. NEC Birmingham. Details: [www.machinebuilding.co.uk](http://www.machinebuilding.co.uk)

**6-9 April:** Foodex Meatex food and meat industries exhibition. NEC Birmingham. Details [www.foodexmeatex.co.uk](http://www.foodexmeatex.co.uk)

**24-30 April:** Interpack international packaging and confectionery machinery exhibition. Dusseldorf. Details: [www.interpack.com](http://www.interpack.com)

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FP PACKAGING MACHINERY

## Three lane tray denester feeds new Cadbury's Fingers

A three lane Pneufeed tray denester has been installed at Burton's Biscuits, Blackpool, to deliver plastics trays onto a new automatic packaging line for Cadbury's Fingers.

The denester feeds the trays wide edge leading onto a three lane plain belt conveyor at the rate of 60 trays a minute.

Each lane on the host conveyor is fitted with a photocell which detects when the tray queue has reached a high level and this automatically signals the denester to stop supplying trays to the respective lane.

FP ensured easy integration of



**Three-lane denesting:** Pneufeed unit delivers trays for chocolate fingers

the denester with the conveyor using its in-house CAD system to create a full model of the machine. Special details include a variable angle flap fitted to the outfeed to ensure a smooth flow of trays onto the conveyor.

T: 01483 532811

E: sales@freezepack.co.uk

YORKSHIRE PACKAGING SYSTEMS

# Fabric rolls wrapped by largest side-feed sleever

Flame retardant fabric manufacturer Panaz based at Fence, near Burnley, is now wrapping rolls of material for shipment around the world with a 2 metre wide side-feed sleeve sealer – believed to be the largest of its type installed in the UK.

Supplied by Yorkshire Packaging Systems (YPS), the Rochman machine replaces a manual operation in which rolls were placed in bags by hand, allowing Panaz to cope with increased demand from the international healthcare, hospitality and marine contract industries.

As rolls are fed into the film curtain, long edge leading, their diameter is automatically measured and the system adjusts to provide the tightest possible bag around the product before shrinking, with the seal made down the long edge.

This, points out YPS, allows



**Side-feed wrapper:** Panaz has automated the wrapping process for rolls of cloth

random size product to be fed and the best presentation to be achieved.

Sleeved rolls are then pushed sideways into a standard double chamber shrink tunnel, short edge leading, in the usual fashion.

Because of product weight, the machinery has also been upgraded in a number of areas including the infeed belt, pusher system and shrink tunnel belt and side chains.

T: 01924 441355

E: enquiries@yps.co.uk

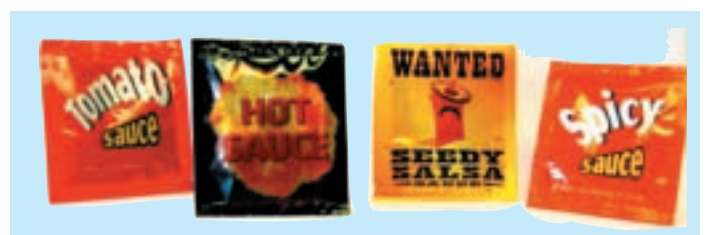
SPRINGVALE EQUIPMENT

## Sachet machines use thinner film to give payback in two years

Two Italian built Boato Pack sachet machines installed by Unilever Bestfoods at Burton-on-Trent two years ago have now paid for themselves with savings in material, wastage and labour costs compared with the previous machines employed, according to supplier Springvale Equipment.

At the same time, says Springvale, line speeds and efficiencies have also been improved.

The two six-lane Boato Pack Tornado machines are producing



**Sauce at less cost:** Boato Pack machines operate with lower gauge film

four side seal single-serve sachets of sauce at the rate of 90 a minute each and feed the sachets as strips which are folded into storage boxes by four Mitsubishi machines, also supplied through Springvale.

Storage boxes are then transferred to another Unilever factory where a further two Mitsubishi machines feed the sachets from the boxes into

individual pot noodle containers along with the noodles.

Significant material cost savings have come from the use of much thinner film than could be handled by the previous machinery, explains Springvale. Originally, 50 micron film was necessary but the Boato Pack machines are able to operate with 38 micron film.

T: 01420 542505

E: springvale@springequip.co.uk



**Replacing padded bags:** Cattle tags cost less to post in sealed trays

PACKAGING AUTOMATION

## New post costs give trays an advantage for livestock id tags

Identification tags for cattle and sheep sent through the post to farmers by the suppliers, Ritchey, Yorkshire, are now packed in trays sealed on a hired Packaging Automation PA210 machine, so helping to keep postal costs down.

With the new Royal Mail pricing structure linked to size and bulk, Ritchey faced the prospect of its

mail bill trebling if padded bags continued to be used.

“We needed something to fit through a 25mm slot so we could send out one or two replacement tags without trebling the postal charge,” explains Ritchey’s technical production manager Nigel Myers.

“We can send out up to 1000 individual tags a day – although the average is 250-300 – so keeping costs down matters,” he points out.

T: 01565 755000

E: info@pal.co.uk

XACT (PREPACK)

## Flow-wrapping duo handle high clarity film for fruit packs

Cross & Wells fruit packhouse in Sittingbourne, Kent, has installed two Spanish built Belca Malta 700 flow-wrappers from UK distributor, Xact (Prepack) as part of a wider investment in automated packing and labelling systems.

The machines are to be used to pack Cross & Wells’ premium lines for major multiples, in particular its stone fruit range. This, says Xact, was primarily due to the Malta’s ability to use a high clarity film, which was proving difficult to run on existing machinery.

“We can now pack a variety of fruit faster, easier and with more assurance,” says packhouse manager Ray Hostler. “If we increase our flow-wrapping lines, the Malta would be top of our list for efficiency and cost effectiveness.”

The Malta 700 runs at speeds up to 90 packs a minute and is said to be well suited to products that are traditionally difficult to wrap, such as high sided punnets.

T: 0151 479 3020

E: info@xactprepack.co.uk

**Machinery Finder:**  
**PPMA.CO.UK**  
 PPMA UPDATED DAILY

MARLIN STAINLESS

# Stainless motors for oil spray cut costs on UB Twiglets line

Stainless steel motors installed by United Biscuits' to drive spinning disc oil coaters on its Twiglets production line have improved hygiene, reduced downtime and maintenance and extended motor life, compared with conventional AC motors.

The oil, which is viscous in nature, inevitably gets deposited upon the disc drive motors and has to be cleaned off at regular intervals. Previously, with the conventional motors, this meant removal of the units for cleaning by hand, which took a weekend to complete.

In contrast, the smooth bodies, round terminal boxes and IP66 sealing of the Marlin motors allows them to be cleaned in situ with steam lances.

Being located directly above the line, the motors' stainless construction also eliminates any hygiene risk from both flaking paint and corrosion.

Marlin Stainless explains that



**Clean-in-place:** Twiglets line oil spinner motors no longer need removal

as well as coating the external surfaces of the original motors, the oil also penetrated the cowls covering the motors' cooling fans, leading to unbalanced running and wear on the bearings.

"This, in conjunction with vigorous cleaning routines, shortened the working lives of the original motors to less than a month. Hence there was frequent

downtime plus the expense of new motors and the cost of fitting them," the company explains.

By comparison, the Marlin stainless motors have been installed since Easter 2007 and are still functioning efficiently and have not required dismantling for cleaning.

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AUTOMATED PACKAGING SYSTEMS

# Air pillows save costs and space as void fill for spares

Preston-based boiler manufacturer Baxi has bought an AirPouch air pillow void-filling system from Automated Packaging Systems to replace two rented paper-based systems used in spare parts distribution.

These crushed paper into void fill, but required large quantities of material, prompting the search for an alternative.

"The two existing benches have now been replaced by one totally



**Saving labour:** An Air Pouch system is now used by Baxi

portable, small-footprint machine that provides easy-to-use air pillows on demand," says Baxi expediter Alan Shaw. "As well as saving floor space, only one

operator is now required."

The AirPouch machine creates continuous strips of air pillows with easy-tear perforations at the rate of 15 metres a minute.

These go much further than the large amounts of paper previously used and provide greater flexibility, says Alan Shaw.

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KUKU AUTOMATION + ROBOTICS

# Robot palletiser software adapts to run gantry based system

Automation specialist Kuka has adapted its PalletTech robotic palletising software to provide KP Foods' factory in Billingham, Cleveland, with a control system for a new Güdel gantry-based palletising system, installed to automate a manual operation.

The software is now controlling the system's conveyors and a pair of 30 metre long gantries fitted with bridges and vacuum grippers.

These grippers can pick up to three cases at a time and make as many as three separate drops onto the pallets. A range of box sizes can be handled by the system which is capable of palletising to 32 different locations. It can also handle empty Chep pallets.

Each gantry has its own Kuku control panel which enables the



**Automated palletising:** Kuka software guides the KP Foods gantry system

operator to monitor the palletising process.

"While the gantry system offered the most cost-effective, automated solution that could be accommodated in the available space in the factory, the challenge for Kuka was to adapt its PalletTech software which is designed for use with robotic palletising operations," explains Paul Richards, general sales manager at Kuka Automation + Robotics.

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# Five point rating for the Retail-ready route

ACCELERATING INTEREST IN RETAIL-READY PACKAGING IS BEING ACCOMPANIED BY A FRESH SET OF IGD GUIDELINES TO HELP ASSESS THE POTENTIAL EFFECTIVENESS.

From humble beginnings, RRP – retail ready packaging – has grown to be an established part of the multiples and brand owners' assessment of both new and existing products. As James Tupper learning manager at the Institute of Grocery Distribution's Efficient Consumer Response (ECR) unit says: "RRP is here to stay.

"The challenge is to ensure that it is delivered in such a way that is fit for purpose," he tells *Machinery Update*. "The remit of ECR UK here is to provide guidance that delivers operational and environmentally efficient packaging which supports product availability and ease of shopping."

ECR UK has not been idle in this respect over recent months with a new version of the RRP Assessment Tool published in March this year. This is a free tool to help assess the potential effectiveness of any proposed RRP solutions against current and benchmark packaging.

For use in conjunction with ECR's *Retail Ready Packaging Functional Guidelines*, the RRP Assessment Tool features a simple-to-use Excel workbook format to provide comparative ratings against five key consumer and in-store operational criteria:

- How easy is the packaging to shop?
- How easy is the packaging to identify in the back of store?
- Can the packaging be easily opened?
- Can the packaging be easily merchandised to shelf?
- How easy is it to dispose of and recycle the packaging?

The IGD believes the output enables companies to understand the relative effectiveness of different packaging solutions, and highlight where further development work could deliver extra benefits.

In June, a new working group was set up by ECR to examine the environmental impact of RRP in the supply chain. The initial focus of the group will be to raise awareness in the industry



**Ready for display:** Clifford Packaging's RRP solution for wine at Tesco allows existing manual and automatic case-packing methods to be retained

and among the public about the high standards of recycling of corrugated board used in the retail industry.

"RRP already delivers benefits to the consumer, supplier, and retailer but we need to ensure that these are delivered in a format that reduces environmental impact," explains Brian Gibbs, RRP development manager at Asda and co-chair of the working group. "The core objective of the group is to integrate environmental thinking seamlessly into the overall ECR UK retail packaging strategy, and to share best practice across the industry."

The group represents the entire RRP industry as membership is drawn from the corrugated packaging industry through to retailers. The environmental sub-group plans to issue a project scope and set of objectives later this autumn, and is planning to publish an output document by late 2007.

"This document will focus on environmental best practice and will be used in conjunction with previously issued ECR UK guidelines on RRP," says Brian Gibbs.

Meanwhile, a brand new RRP format for wine that Clifford Packaging hopes will become a wine box industry standard is just going into production and was due to appear on the shelves this summer.

The brief to Clifford Packaging from Tesco was to create an RRP solution that could go directly on the shelf as well as gondola ends, to produce a multi-functional product to reduce the number of free-issue carriers currently given away, and to improve the presentation of the wine in-store. The '1066' design for the drop-in wine box market is said to meet all RRP criteria and includes an integral handle for easy in-store handling which also improves customers' shopping experience.

"Our design has many benefits including approval by leading UK retailers, the latest perforation technology, and it fits on all existing

## RETAIL READY PACKAGING

packing lines, either hand or automated," says Rowan Tinn, innovations development manager at Clifford Packaging.

"Recent transit trials with Tesco proved successful for one of its South African Finest range, in conjunction with a wine producer in Cape Town," he adds. The design is available in wine producing countries under licence.

DS Smith Packaging is encouraging customers to take a different approach to RRP and asking them to take a fresh look when designing new formats. The company says developing new RRP is an ideal opportunity to drive some cost out of the supply chain and reduce the carbon footprint.

"The first initiative we took was to create a supermarket," explains

director of DS Smith Terry Ousley. "The Impact Centre provides customers with an opportunity to see how their current and new packs work in a simulated retail environment."

Before introducing its new 1-litre Shape flavoured spring water into the market, Danone Waters consulted major retailers to understand their requirements for a retail ready pack before setting up a day's workshop with designers at DS Smith Packaging's Devizes plant.

During this workshop, the Danone Waters team was able to arrive at a design which both satisfied the retailers' brief and could be run on an existing Cermex wraparound machine at the Danone bottling plant at Blaen Twyni – an essential element of the brief.

Ease of handling throughout the store has been paramount in the design of the 12 x 1-litre bottle pack. Grab handles each side of the pack allow easy lifting from the roll cages, while to convert from a transit wrap to a display outer a removable panel is torn off with a single movement.

To achieve a clean cut opening feature able to withstand transit conditions without puncturing, yet easy to open by the store staff, DS Smith's design team introduced a series of diagonal perforations to reveal a display outer which can be easily loaded onto the shelf, eliminating the decanting necessary with conventional cases. The sloping side walls provide additional bill boarding to promote the brand,

while the remaining front panel continues the label design of the clear PET bottles.

Cheddar brand Pilgrims Choice has developed a new retail ready pack which is said to be unique to the dairy sector and likely to be taken up widely by other types of product. The retail display pack is designed and manufactured by



**Existing machinery used:** Shape water RRP can run on an existing wraparound case packer

DS Smith Packaging at Launceston.

Design director at Launceston Roger Wonnacott says: "The tearing mechanism is quite complex in terms of manufacturing, but avoids one of the pitfalls often associated with perforations. Because the new pack restricts the perforations to the top of the box, it has totally eliminated the problem of unsightly tears on the front and side of the pack which worries some retailers."

### Series of seminars

Smurfit Kappa is offering a series of seminars to encourage companies to include different disciplines, from purchasing, marketing and supply chain managers to packaging technologists in the development of RRP solutions.

Eye Opener is an introduction to RRP, while Shelf Assured is all about converting shelf ready into retail ready packaging – ready for the broader retailing operation rather than just the shelf – and finally, the company offers Retail Ready in One Day. This is a fast-track development process using the facilities and resources of Smurfit Kappa.

It was through attending a Retail Ready in One Day session that the Black Sheep brewery

was able to formulate an RRP solution acclaimed by both Asda and Tesco as "Best in its Class."

Smurfit explains that initially, manufacturers and suppliers were urged to convert to shelf ready designs that aided the transit-to-shelf process to improve availability, but RRP has now moved into a new realm where brand image is also a critical consideration.

Brand owners such as Black Sheep are taking into account a number of practical and aesthetic considerations when formulating RRP designs.

Ken Allen, Black Sheep Brewery national sales manager, believes that RRP is an essential sales tool to help create differentiation.

"As a premium bottled ale brewer we sell into a niche market, but it is a market where the competition is increasing," he says. "The RRP



**Sales tool:** RRP for Black Sheep lifts product differentiation

design we created with Smurfit Kappa has helped us to achieve shelf stand out from our competition by combining high impact graphics with visual appeal and practical application."

CRP Print & Packaging believes the trend for RRP means that as well as having to be structurally functional and economic, packs must be consumer friendly in appearance and therefore print plays a crucial role in its development. "At CRP we have both litho and pre-print available for our customers to choose from," says Dev Brahmachari, sales and marketing director.

"The developments in print mean that RRP can now be a cost effective way to add value by facilitating quick restocking of shelves and increasing visibility, thereby contributing to an increase in sales volumes in stores," he adds.

Recent projects include cases for Thorntons, used directly on shelf, especially at 'pester points' in store, as well as by the counter, and trays for Cadbury used in convenience stores on shelves or on counters. ■

# Retail-ready can use existing Machinery options

THERE IS A BROAD CHOICE OF MACHINERY TO PRODUCE RRPs, INCLUDING CONVENTIONAL CASE-PACKERS AND, IN PARTICULAR, MORE FLEXIBLE EQUIPMENT BASED ON ROBOTICS.

Whatever it's called – transit-display packaging, shelf-ready packaging, or the latest buzz term retail-ready packaging (RRP) – the concept of putting products in a corrugated transit pack that can go straight on shelf in a store with the minimum of fuss is well over 30 years old.

What has changed is the advent of more flexible machinery – particularly based on robotics – able to cope with more than one type of pack style and to be changed over quickly between different pack styles. Even so, there is a broad choice of machinery to produce RRPs, which is immediately narrowed once a decision is made about the style of pack that must be produced.

Typically the choices of case and tray based RRP will be:

- Shrinkwrapped trays.
- High wall trays.
- Two piece packs.
- Cases with perforations or tear tape.
- Returnable plastic trays.

Shrinkwrapped trays were the original RRP but while in the past the manufacturer could decide the size of the tray, based on the minimum number of products it wanted to sell at a time or the best fit for a pallet, the major retailers now want the size of the tray to match the size of their shelves and the number of facing products they want to display on that shelf.

So manufacturers are now being required to produce some unusual shapes of shrinkwrapped tray, often with fewer products per tray, which may require new tray-packing equipment.

The two most common machines for producing shrinkwrapped packs are a wraparound tray packer or a separate tray erector and tray loader. Wraparound tray packers lend themselves to producing the deep but narrow packs that major retailers are now requesting and many designs of wraparound machine are also able to produce wraparound cases as well as trays, allowing different pack styles to be pro-

duced, if necessary, for different markets or retailers.

In addition, some designs of wraparound tray packer give the user the flexibility to produce both shrinkwrapped trays and unsupported shrinkwrapped packs on the same machine for those retailers who are still more concerned about packaging waste.

For example, ten Bradman Lake Europack shrink/tray wrappers capable of different pack styles started work last year in a £1 million plus makeover of end-of-line packaging at Twinings' tea bag plant on Tyneside.

Each machine will collate cartons and produce tight film shrinkwraps or erect minimum depth trays, then load and shrinkwrap them in single or twin face packs at speeds up to 30 a minute. There are eight possible carton collations ranging from single face 1 x 4 to 2 x 6 twin-facing shelf ready formats. Changeovers, including changeparts for the tray forming tool, are said to take just 15 minutes.

Limited floor space at Twinings' plant led to a further innovation by Europack. Three different

operations are combined to give the smallest footprint: carton collation, tray forming and shrink-wrapping all take place in one unit.

## Loading cases and plastic trays

Generally, there now appears to be increasing interest in systems that use a separate tray erector and a tray robot or pick-and-place tray loader, because the same product loading machine can be used to fill not only trays of different dimensions but also returnable plastic trays or top load cases.

For example, the new Apsol RCP pick-and-place case-packing robot, available in the UK from Integrapak, is suitable for a variety of shelf ready packaging including display boxes, trays, and open top cases, in single or multiple layers.

The RCP can be supplied with various types of product infeed systems to suit products such as bottles, ready meals, bags, pouches and flow-wraps, and uses quick-change format parts. It can also operate with either a separate or monobloc case erection system.

High wall trays are generally used for prod-



**Three operations in one:** Europack shrink/tray wrappers have been installed at Twinings, Tyneside



**Wraparound or two-piece display:** Cama FW 749 Combi case packer can produce both styles

ucts such as bags or cartons that need the support of the high wall to give the pack adequate compression strength for stacking. However, the high wall can sometimes be a problem on the supermarket shelf because it can restrict the view of the product, especially if the tray is very deep.

As with shrinkwrapped trays, the two main types of machine for producing high wall trays are wraparound tray packers and separate tray erectors and tray loaders.

**Two piece packs**

Two piece packs are particularly favoured by the major retailers and marketing departments because the base tray can be shaped and printed to give the products the optimum shelf appeal and product branding, while the lid can provide the necessary protection and crush resistance to ensure that the products arrive at the store in good condition.

There are three main methods of producing two piece packs. The first method is with a machine designed specifically for making two piece packs, which incorporates separate magazines for the base tray and lid. The second method is to form the base tray in a wraparound tray packer and then apply a lid or top tray to this pack in a separate machine. The third method uses a wraparound tray packer with an extra lidding station which can be used when producing two-piece packs or turned off when producing packs without lids.



**Choice of pack style:** MAF Combimatic shown creating a wraparound solution using a perforated blank

For example, Italian manufacturer Cama has developed the FW 749 Combi case-packer that can produce both wraparound cases and display packs, through the combination of a wraparound case-packer operating at 30 cases a minute with a system that can make two-part display boxes, at speeds up to 20 a minute.

Also from Cama is the Monobloc case-packing machine which operates at speeds up to 50 display boxes a minute, combining different modules for product loading, forming and closing/lidding. Access can be gained to each without stopping the others by the use of small accumulations between the different work stations. Subject to the working area, manipulation speed and required payload the Cama two or three-axis robot can be integrated into the machine.

Full wraparound cases, high sided wrap-

around trays and two-part cases with a lid can be produced by the Combimatic 700, developed by German manufacturer MAF to allow a choice of transit packs to be produced on a single, compact machine.

Recently upgraded to full servo operation, the machine is able to handle bottles, cartons and similar conveyor-collatable primary packs at speeds up to 25 cases or trays a minute, depending on size and style. Changeover between each size or pack style takes less than ten minutes, according to MAF's UK and Eire agent Partners in Packaging.

The Combimatic 700 consists of a wrap-around tray and case-packing station and a lidding station combined within a single machine measuring 4 metres long by 1.2 metres wide.

In its first section, the machine employs conventional collation and wraparound case or tray packing technology, with a choice of either custom built or standard options based on existing MAF case-packing equipment.

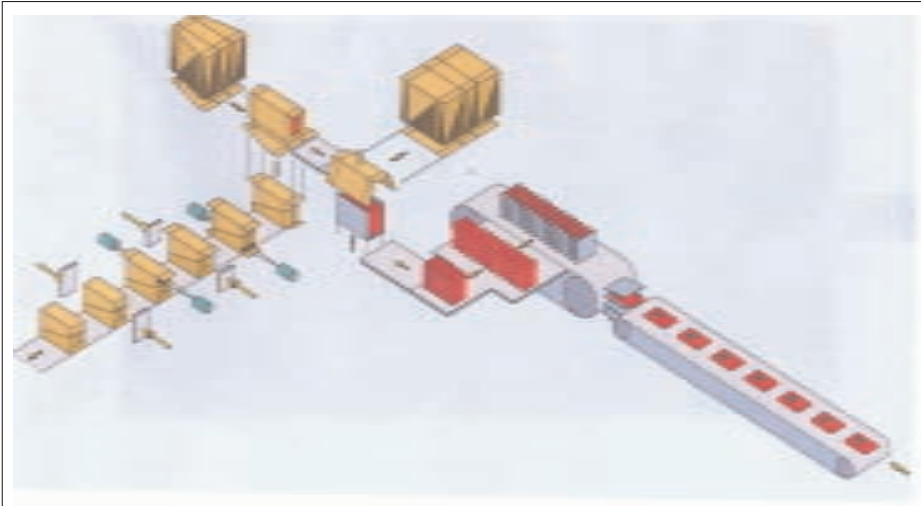
The wraparound can be complete, for a totally

enclosed case, or partial, providing a tray with high sides for full product visibility from the front for immediate on-shelf display. These high sided trays then pass immediately to the lidding station where a blank is wrapped tightly round the top and secured by hot-melt adhesive.

For food and dairy industry applications, the Combimatic is available in stainless steel execution and with electrical components sealed to IP65 for washdown.

German manufacturer Paal is also building machinery to produce two piece, full wrap-around cases or wraparound trays on the same machine.

UK and Ireland representative CC Automation reports that recent installations have included margarine, shampoo and other hair care products, as well as petfood and detergents,



**Handling pouches:** IWS uses this system for its Invopac two-piece case-packing machine

using wraparound, two-piece cases and also RSC cases with a tear-off lid. Further installations include machinery to handle cartons and flexible packs.

Some designs of two-piece packs call for the lid to be tucked into the base tray rather than being wrapped around the base tray. This type of pack can usually only be produced on a dedicated two piece pack machine, but an alternative is to pack the products upside-down into the lid and then form the base around the lid in a separate lid applicator.

A further alternative, in which a lidding station can be retrofitted to existing tray-packing machinery to produce a two-piece pack was demonstrated at May's Total exhibition for the first time by Smurfit Kappa Machine Systems.

Operating with flat blanks fed from a low level magazine, the system can work with both top-load tray packing equipment and also with wraparound case-packers when used to create trays, providing a wraparound lid secured by a combination of adhesive and tuck-in sections.

Shown working with a typical high-sided, low-front display tray, the machine first folds and tucks the lidding board into the tray at front and back, behind the facing strips, then folds and glues the lid sides to small pre-perforated areas on the sides of the tray.

In this way, with the lidding board tucked in and extending the full height of the tray, stacking strength is improved and there are no glue or tear lines on the facings.

Equally, as the tray is opened the small perforated sections at the side come away with the lid, leaving clean edged apertures that in most cases would, anyway, be hidden by adjacent trays.

The new lidding station operates on demand, with no control tie-in to the host machine, allow-

ing it to be readily employed with tray-packers of most makes.

Swiss manufacturer International Wrapping System (IWS) has developed a pouch infeed system for its Invopac intermittent two-piece case packer, allowing the machine to handle stand-up pouches as well as four-side-seal pouches and similar flexible packs that cannot easily be marshalled into the correct collation in the same way as cans, jars or bottles. Speed is up to 36 cases a minute and full wraparound cases can also be produced, explains UK representative F Jahn & Co.

The IWS system accepts the filled pouches arriving flat in single or twin file and brings them into an upright position in the required collation, such as 12 x 1 or 12 x 2 per case. The complete collation is then moved into the packaging machine where the case blank is wrapped around and glued.

### Wrapped around the base

In a tray and lid display case application the lid is first wrapped around the base of the pouches, held in guides, then the base blank is applied separately and wrapped around the lid.

The IWS machines are built on a modular basis and can be equipped with different pre-grouping systems to handle products such as pouches, chocolate bars, biscuits, yoghurt cups and so forth. F Jahn says the machines are particularly flexible, allowing a number of different formats in different case sizes to be handled on one machine and a changeover time of 5-30 minutes.

Case and display tray packers from J+P Dresden – represented by Propack Automation – are available to load flexible packs either standing up or laying flat, as well as more rigid

## Cat food line provides choice of RRP and multipacks

Butcher's Pet Care in Northampton has installed a purpose built line from German manufacturer Oli – represented in the UK by Allied Pharma Machinery – to create two sizes of retail ready packs for single serve cat food pots, measuring 20mm high and 110mm in diameter.

Able to handle up to 80 pots a minute the system will produce 6 x 1 multipacks – of two mixed flavours if required – loading four of these onto a shelf-ready tray, as well as a 12 x 1 wraparound case with tear-off lid. Trays are subsequently shrinkwrapped on a Sotemapack machine and palletised on an Oli-Pal machine.

"The line has proved a great success, given the level of performance we need," says Lawrence Dawson, project manager at Butcher's. "We particularly like the good accessibility of the machines, their compact designs and the amazingly quiet operation of the plant."

In operation, pots arrive at the line lying flat on two parallel conveyors and are fed alternatively from each into an Oli vertical race track

products such as cartons and household goods.

The J+P Model KVTF forms the trays from flat blanks and presents them for loading with product arriving lying flat on the machine infeed which, points out Propack, has the advantage that flexible packs can be equalised, lane-divided and marshalled, before being loaded into the trays.

Erected trays are presented to the product loading station standing almost vertically, open side facing towards the incoming products. As each product layer is grouped and transferred, the tray indexes downwards and a loading tongue enters the tray, above the completed layer. Gentle pressure from the loading tongue keeps completed layers slightly compacted, ensuring that space is available to load the remaining layers, until the tray is filled. Running speeds are generally up to 120 items a minute but can be higher, depending on the format in the tray.

The KVTF display packer can also be equipped with a lidding station where the lids are formed from flat blanks, sealed with hot melt adhesive, and applied to the filled trays.



**Shelf-ready tray:** The trays of 12 primary packs use push-in lugs to hold the product upright when part full

collator which turns them up on edge while allowing a two flavour mix to be assembled if required for the six-packs. The complete collation is then pushed across into an Oli wrap-around case-packer, which uses cartonboard for the six packs and corrugated for the 12 packs.

Six packs are then tipped backwards 90 degrees, so that the pots inside are penny-stacked for presentation – and on view through the open corner of the pack. They are then placed in 30mm high corrugated trays in a 4 x 6 format on an Oli wraparound tray loader and shrinkwrapped.

When 12 packs are being produced, and pots are on edge, the tray loader is by-passed and the wraparound case passes into a custom-designed station where perforated lugs in the base of the case are pushed in pneumatically, up between every third pot.

These prevent the pots falling over as product is removed from the shelf-ready tray, which is created in store by tearing off the top section of the wraparound case.

All completed display packs then pass to the Oli-Pal palletiser, which is equipped with a layer sheet inserting mechanism.



## Banding as handles

BandAll band applicators supplied by Erapa UK can be used to apply plain paper or plastic bands up to 100mm wide to secure primary packs within display trays and provide a handle for shelf-loading. Once the tray is in place on shelf or in a freezer compartment, the band can be easily removed without knives or scissors.

Other types of top closure are also available and the systems have tool-free changeover.

However French machine manufacturer Cermex has come up with a new variant on the two-piece pack theme, using two separate corrugated board blanks.

The F550 Multi-packaging erector is designed to handle full and half RSC cases, but also assembles a low tray and a half case, which

can then be detached so that products can be slid directly onto the supermarket shelf. Speed is up to 30 cases a minute.

Side-load case packers can also be equipped to provide a shelf ready pack as German manufacturer Focke & Co has demonstrated, with a machine delivered to a manufacturer of paper tissues. The machine loads wrapped packs of tissues into a pre-glued standard half open case

blank with a pre-cut aperture – for consumer access – and inserts a U-formed lid, one side of which is deep enough to blank off the aperture during transit. Conventional cases can be handled as well.



**Side-loaded case:** Tissue packs are loaded into this two-piece case on a Focke machine

## Cases with perforations or tear tape

However in many instances it is unnecessary to purchase new equipment to produce retail ready packs. Both conventional top load or end load cases can be converted into shelf-ready packs if the cases are die cut with perforations or equipped with tear strips. This means that both top load and end load case-packing machines can be used to produce retail-ready packs as well as conventional cases.

One of the problems can, of course, be retailer resistance to ragged edges caused by tear tape, although case design can reduce the effect considerably, as Fords Packaging Systems, UK representative of German manufacturer Meurer, demonstrated at the Total exhibition in May.

The wraparound case-packer employed was shown handling food trays, loading them horizontally for transit to retain maximum stacking strength. For display the case is turned 90deg to place the trays on edge and the tray section created via a tear tape.

However, case construction is such that the cut edge of the blank is maintained at the side of the tray and at its front facing panel, giving a clean finish and avoiding the ragged edges of a tape-cut, except at the very back which can remain hidden by product.



**Tray loading:** CPS machine handles fresh produce, meat and ready meals

Indeed cases incorporating tear strips can be employed to produce RRP's using simple case erectors and case tapers, provided the tape wipe up is less than the depth of the on-shelf display tray.

Most case tapers have a wipe-up height of 50-60mm, making them unsuitable for sealing cases that will be made into RRP's, because forming the display using the tear tape will remove the adhesive tape that holds the bottom of the pack together.

However, the latest Loveshaw LD 3SB side-belt case taper uses a new tape cartridge which produces a wipe up height of as little as 25mm, front and rear, avoiding the problem of over-taping the perforation or tear tape.

Loveshaw makes the point that substantial savings can be made with a tear-off lid box compared with glued shelf-ready packs and that its LD3SB machine is able to deal with cases or cartons as narrow as 85mm. The new 25mm tape cartridge can also be retrofitted to many existing Little David case sealers.

Endoline also is now able to offer tape heads with a wipe up of 30mm front and back, but can also modify the wipe-up on the trailing end of the case to bring it down to 20mm. Sales have increased significantly over the last year says the company, which sees the trend continuing.

### Returnable plastic trays

With the renewed enthusiasm for corrugated board shelf-ready packs it seems almost impolite to recall that only a couple of years ago the major retailers were calling for as many products as possible to be delivered in returnable plastic trays. Even so, returnable plastic trays remain the preferred RRP for many types of fruit and vegetables as well as bread.

Inevitably, plastic trays need to be loaded from the top using either drop packing techniques or pick-and-place and this makes plastic trays quite compatible with other packages that need to be loaded from the top, like high wall trays and conventional cases.

For example, Dutch manufacturer CPS Case Packing Systems, represented in the UK by Multipond, has developed a new case-packer to pack trays of produce, meat or ready meals in corrugated cases or crates ready for on-shelf display.

### Variety of patterns

The machine is able to rotate individual trays, which provides the opportunity for a wide variety of packing patterns and uses a pick-up head that places a complete layer of product into the crate, case or tray at a time. The CLP version handles rigid and semi-rigid products while the CL64 is for flexible packs. Speed is up to 120 primary packs and 20 cases or trays a minute.

Finally, Krones has launched a new X-ray inspection system to run a contents check on completed cases or trays at speeds up to 75 a minute.

The Checkmat VKX inspects open or closed packs made of board or plastic, verifying that the correct number of containers is present and, in the case of PET bottles, makes a rough check on the fill levels. A fill check can also be made through the width of four returnable glass containers or six non-returnables.

Inspection is performed through the side of the pack at right angles to the conveyor's direction of travel and the machine can be optionally equipped also to detect open flaps, pack colours and pack length. Up to six camera systems can be included to check logos, labels, barcodes, and overprinted dates. ■

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When X-ray systems first entered the commercial marketplace, discussions centred on the technology's contamination detection capabilities, and whether X-rays would ultimately usurp metal detectors in production and packing lines.

Several years on, the spotlight has shifted onto X-rays as checkweighers, with some of the major players in inspection technology introducing X-ray machines that run checkweighing software. This means X-ray systems can be used not only to guard against foreign body contamination but also to verify pack weight.

The way in which the two systems carry out this function is, of course, very different. Alan Johnson, group product marketing manager at Spectrum Inspection (Loma-Cintex), explains the basics:

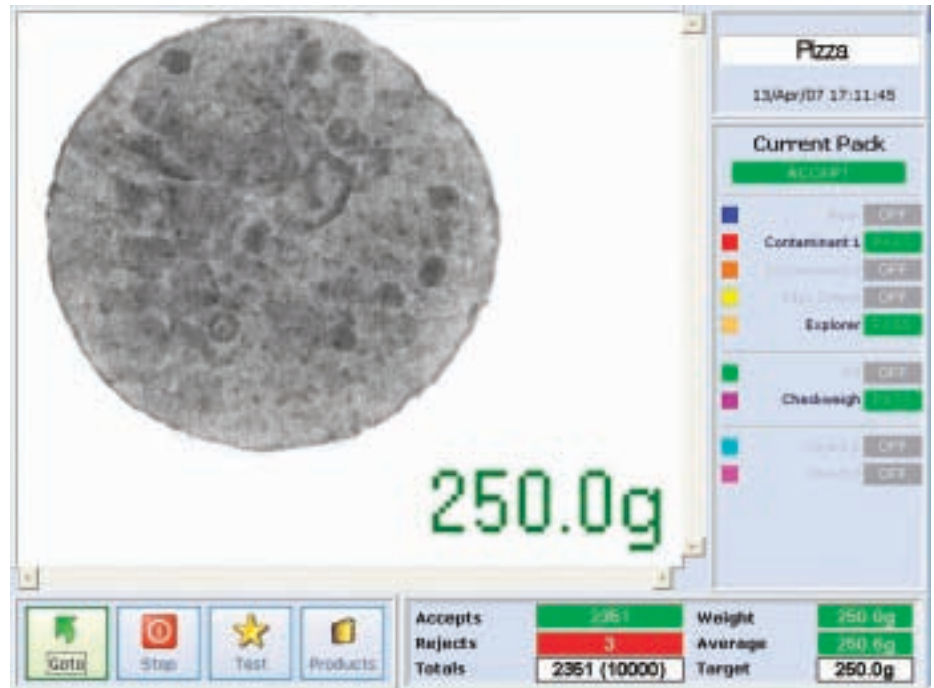
"Checkweighers rely on the force of gravity exerted by an object on a weighing platform. Checkweighers weigh dynamically and the scale is in the form of a conveyor that transports the product from one end of the machine to the other. This conveyor is typically mounted on a loadcell; the loadcell deflects or moves in proportion to the 'weight' of the object. Heavier weights cause more of a deflection than lighter weights and this deflection is converted into an electrical signal which an on-board computer processes. The weight is then displayed."

"X-ray weighing is achieved by inspecting the density of the product – a by-product of contaminant inspection. The simple equation of density equals mass over volume becomes the starting point for evaluating the mass (weight) of the object. Sophisticated software algorithms are then applied to the product being inspected to produce a weight reading as well as production statistics."

So does this mean that one day in the not too distant future, X-rays will render the checkweigher-metal detection combo obsolete?

According to Loma-Cintex, which launched the X-weigh – an X-ray system with checkweighing software – at the Total exhibition earlier this year, there are some compelling arguments for trading in a checkweigher-metal detector for an X-ray machine.

"Most checkweigher-metal detector applications can be replaced by X-ray machines with a checkweighing function," says Alan Johnson. "A major advantage is that they occupy no additional space in the production line and can perform the checkweighing function to a high degree of accuracy – comparable to that of traditional checkweighers."



**One stop quality control:** Loma X4 X-ray machine now has checkweighing software

# X-weigh or checkweigh?

X-RAY INSPECTION MACHINES CAN NOW ALSO PERFORM CHECKWEIGHING FUNCTIONS, PROVIDING A COMPLETE QUALITY CONTROL SYSTEM IN A SINGLE UNIT. EVEN SO, FEW OBSERVERS PREDICT THE DEMISE OF THE CONVENTIONAL CHECKWEIGHER.

However, not everyone in the industry necessarily agrees with this.

Far from the two technologies being comparable in accuracy, Bob Ries, Thermo Fisher Scientific's contaminant inspection product manager, says that generally a checkweigher is in the order of ten times more accurate than an X-ray machine.

## Inherent accuracy

Indeed, Mettler Toledo's X-ray marketing manager Nicola Vosloo believes the checkweigher's inherent accuracy is one selling point that will assure its long term survival.

"We don't believe checkweighers will become obsolete because there is still a need in the market for accurate weighing measurements – you

can get much greater accuracy on a checkweigher than you can on an X-ray," she says.

Ishida Europe claims that its IX-GA X-ray can achieve more accurate results than some of its competitors because of the way it calculates the weight parameters.

"After passing a product ten times through the X-ray unit, the IX-GA creates a reference table from which each gray scale of the image is converted into weight parameters. The system then optimises the formulae depending on the level of gray scale, whereas many of our competitors only use one fixed formula to get weight parameters from the gray scale," explains Ishida marketing manager Torsten Giese.

Of course, the degree of accuracy that can be achieved by an X-ray or a checkweigher depends

on the product in question, as Nicola Vosloo explains.

"X-ray will only really be accurate if the product is uniform and homogenous throughout because the mass measurement is taken off the gray scale image. If you've got loose powder in a pouch that can move around, for example, it won't be ideal for taking a mass measurement – you'd be better off with a checkweigher. A cake bar or cereal bar would work well with X-ray."

This theory is being put into practice at a factory in Germany where cake bars individually wrapped in aluminium foil are passed through an X-ray system supplied by Mettler Toledo. The X-ray not only checks for contaminants, such as metal and stones in the raisins, but also measures the mass of each product.

### Weighing in zones

Where X-ray does offer a major advantage over a gravimetric checkweigher is in 'zonal weighing'. If a pack contains several compartments or components, the mass of each part as well as the whole pack can be calculated by the X-ray. In contrast, users of gravimetric checkweighers have to assume that if the gross weight is correct the individual contents are also present and correct.

"Imagine a TV dinner with various different compartments," says Thermo Fisher's Bob Ries. "A checkweigher can tell you very accurately whether the weight is correct, but it can't tell you whether you're light on peas or heavy on potatoes. That's where X-ray offers a clear advantage; it can look at each zone and even if the total weight is correct, it will be able to tell you whether there are too few potatoes or too many peas. That's an example of where X-ray, although less accurate, delivers greater value."

Ishida has found this principle to be particularly beneficial when applied to 'chain bags'.

"Products packed in a series, such as chain bagged powdered soups and liquid soups for instant noodles, cannot be weighed individually on a checkweigher," points out Torsten Giese. "However, our X-ray technology uses a weight estimation function which estimates product weight from the X-ray image. Specifically, the system calculates the volume of the product from the brightness of the image. This makes it possible to check the weights of such products."

According to Mettler Toledo, beverages are another product that may benefit from X-ray.

"Conventional checkweighers can do a good job of weighing beverage containers, however, to some companies it's just as important to ensure the fill line of the container is always at the same

height. Consumers looking at the product on-shelf will have a natural reaction to buy the bottle with the highest fill line. X-ray, while checking for mass, can also check for fill height," says Nicola Vosloo.

Companies packing pharmaceuticals into blister packs may also get value from an X-ray, as the weight variability of the packaging materials is often greater than the accept-reject tolerances of the package contents.

"Take a 12-pack of tablets, for example," says Ms Vosloo. "Each tablet only weighs 100mg, however the variability of the packaging materials is greater than 100mg. A traditional gravimetric checkweigher could not guarantee that all packages would contain 12 tablets although, using X-ray, the position of each tablet can be verified, plus a check performed for broken, deformed or partial tablets."

X-ray also allows for multi-line checkweighing, so one X-ray machine can replace several checkweighers, with considerable cost savings.

For example, Loma-Cintex says that with its X-weigh system a number of lines can be run through one machine, with each pack inspected according to its own target weight parameters.

Another plus point with the X-weigh, adds Alan Johnson, is that unlike a traditional checkweigher, it is unaffected by pack rate, speed, vibration, air turbulence, pack orientation or stability and requires little maintenance.

### Price tag justified

However, for individual lines it is questionable whether an X-ray's premium price tag can be justified. True, X-rays are coming down in cost, but as Bob Ries points out: "I suspect a lot of the lower price X-ray systems don't necessarily support the more sophisticated functions like checkweighing."

There is also the question of whether X-ray satisfies weights and measures legislation, which is still a grey area.

Checkweigher installations may require certification as a legal trade device by local Weights and Measures officials. According to Mettler Toledo, in most jurisdictions only gravimetric checkweighers comply with this requirement.

"A core element to this certification is the calibration and performance verification of the checkweigher using a traceable certified standard, also known as a test weight. Since X-ray measures item density and converts that value into a calculated pseudo weight, there is no ability to trace the derived value to the certified test weight standard," explains Nicola Vosloo.

## Chinese enter European market with full range of checkweighers

Chinese manufacturer Saimo Technology has opened a sales and distribution outlet in the UK as part of the pan-European launch of a series of low cost checkweighers developed by the company to meet European needs.

The range includes machines to weigh from 2g to 50kg as well as combined checkweigher/metal detectors, while control displays extend from 5in LCD through to 12in full function touch screens.

Memory for a minimum of 100 products is standard.

The Saimo machines are fully integrated, since the company manufactures both the load-cell and the electronic controller. All versions can be set for multiple weight classification zones while advanced digital filtering is said to ensure weighing accuracy.

All traditional checkweigher features such as feedback control to a filling machine, automatic zero and product tracking are included together with the benefits that come from photocell-independent operation. Multi-product

At present, though, the jury seems to be out on whether or not X-rays satisfy these standards.

On the one hand, Bob Ries says: "Standards for calibration of weight measurement by X-ray have not been approved or accepted by any governing weights and measures legislative body."

On the other hand, Loma-Cintex claims its X-weigh incorporates software that complies with national weights and measures legislation and automatically calculates the correct reject set points for European and Canadian Average Weight legislation and American Minimum or MAV weight control.

It is also important to keep in perspective the number of X-ray systems that are actually being bought for weighing applications, as at present, it is lower than some X-ray companies would perhaps like to think.

Bob Ries at Thermo Fisher says: "Only in a very limited number of applications is this actually happening. In general, because traditional checkweighing is so accurate, easy and widely accepted, it continues to be the first solution."

"What we are seeing is that customers are making the decision to buy X-ray because of the contaminant detection capabilities, and then as an afterthought they will look at the check-



**Chinese machines for Europe:** Saimo Technology has launched a range of low cost checkweighers

inspection, classification and recording of several products running simultaneously is also possible.

Saimo says that data logging capabilities are particularly comprehensive with the software protected by multi-level passwords to ensure data integrity.

Specific features include the facility to store

data and alarm records to complement quality control procedures in the factory and a comprehensive statistical analysis of the saved data. Support for industry standard networking protocols is available as is the ability to identify and correct fault conditions remotely.

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**High speed:** Bizerba's new CWE checkweigher can run at 120 metres a minute

weighing option as an add-on. It isn't the other way round – checkweighing isn't driving the purchase of X-ray."

This view is backed up by Chris Keenan of Selo, UK distributor of Anritsu's KD74 X-ray system, who says: "Customers are definitely more interested in X-ray as it is easier for them to justify the expense when the system offers them more solutions. But although a number of companies want to use X-rays as checkweighers, they will only achieve accurate results with uniform products."

### Investing in checkweighers

Typical proof that major manufacturers in the processing industries are still investing in checkweighers, comes from United Biscuits UK which has recently added a further checkweigher from Lock Inspection Systems to its inspection armoury for products such as Jacob's Cream Crackers, Jacob's Club and Jacob's Twiglets.

United Biscuits bought the Lock CK1500 checkweigher to replace an old unit and was particularly impressed by the machine's touch-screen display panel, which shows average, actual, over and underweight data and is said to be easy to read and interpret.

Installed at the end of UB's packing line, the system provides the final check before goods are delivered to customers. A pusher reject device transfers under- and overweight products from the line onto a table, where they can be manually inspected.

Equally, Yamato has recently sold ten G series checkweighers to a large UK packing house.

The G series is said to be capable of weighing virtually any product from 10g up to 6000g at rates up to 330 packs a minute in most environments. Accuracy is usually  $\pm 0.2g$  and this also applies when detecting a missing item in a pack, such as one biscuit in a pack of five, according to Yamato.

Yamato says remote communications, and the ability to download and monitor data, is increasingly a requirement of checkweigher customers who are offered a Data Acquisition Suite package capable of processing data from up to 20 checkweighers and outputting to a remote PC.

### Data acquisition

Yamato recently installed and commissioned a full Data Acquisition Suite to take information from five checkweighers using a multiplexer which then transmits the information to a local PC in real time. Data produced includes giveaways, line efficiencies and costed giveaways. This data can also be used for satisfying Weights and Measures legislation as well as yielding cost savings via improved production efficiencies.

Avery Weigh-Tronix, meanwhile, has saved over a metre of floor space at Crepe Cuisine – a supplier of bakery products to UK supermarkets – by installing a combination checkweigher and metal detector unit to weigh packs of pancakes.

Packs weighing up to 1500g are weighed at speeds of 60 a minute to  $\pm 0.2g$  accuracy, which is a massive improvement on the previous random checks carried out on some 5 per cent of the output.

A lockable bin receives contaminated packs off the conveyor for quarantine and a pusher reject mechanism sends under or overweight packs to a table.

An integral tally roll printer prints data at the end of each production period, including the number of packs, average pack weight and number of rejects, to assist with due diligence.

Selo says one of the key selling points of the Anritsu equipment is that Anritsu manufactures both the weighcell and the metal detector head, which benefits customers buying combi systems as the equipment is more compact than other



**Monitoring biscuits:** United Biscuits has installed a CK1500 checkweigher from Lock Inspection

available systems and can be operated via the same control panel.

The Anritsu range of checkweighers starts with the economically priced SVf, which is mainly supplied to the produce industry. The SVi range has a high protection rating for harsh operating environments, while the SVh systems are high speed/high accuracy mainly used in the pharmaceutical industry.

Bizerba's newly introduced CWE checkweigher has been designed to 'help optimise the quality assurance of pre-packaged goods', and its modular design promises maximum flexibility, according to Bizerba.

Depending on the pack and the production environment, it can weigh packs ranging from 25 to 6000g at line speeds up to 120 metres a minute. IP65 protection and a quick-action conveyor body and belt changing system are said to enable fast, simple cleaning.

The operator can quickly view data via a monochrome display or a 12.1in colour touchscreen. From a visual display of operating speed, pack weights and production trends, pack giveaway can be monitored and the production process controlled.

The CWE multi display concept permits several operating units to be set up at different points in the production line, for example, as remote displays. Short and long-term statistics can be viewed, saved and memorised.

AEW Delford Systems offers a choice of checkweighing systems for the food industry.

The G1000 is said to be a versatile, cost-effective system for general applications. Operating

at speeds of up to 180 packs per minute, it is ideal for packaged products such as ready meals.

The G2200 is a top-of-range system for demanding food processing applications, sealed to IP66. The unit operates at speeds up to 180 packs a minute with modular software for ease of operation and programmability and a choice of average and minimum weight programmes as standard.

### High throughput model

The G2300 Checkweigher is a high throughput system designed for integration into high speed slicing lines. Ideal for cooked meats and bacon, or fresh meats, poultry and fish, the G2300 has a similar specification as the G2200. Up to 200 pre-programmed memories can be accessed via the keyboard, with multi-line networking and RS232/422/485 links for production control.

Ixapack UK supplies a wide range of high-speed single and multi-lane checkweighing systems incorporating touch screen controls that allow up to 200 different programs to be stored and recalled.

For ease of cleaning the machines employ a quick release belt roller system and are available with a particularly broad range of options including reject systems and receptacles, extended infeed and outfeed conveyors, modems for instant trouble shooting diagnostics and optional metal detection combination units.

One popular feature says Ixapack is the on-screen drawings, which can be expanded to show all replacement part numbers. Data retrieval

can be via a simple ticket printer or transfer to a PC using a data storage card or network.

The Dynamic CWS checkweigher/metal detector made by Iman Pack of Italy is now available from UK representative Friedheim International in three versions: HR-600, SR-1600 and HL-3000, all supplied in either plain stainless steel or painted and left or right handed.

Respective weighing ranges are 10-600g, 20-1600g and 50-3000g with speeds up to 350 items a minute depending on model. ■

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# Applications will help define The role of robots

ROBOTS ARE NOT ALWAYS THE COMPLETE ANSWER TO HIGHER PRODUCTIVITY AND FLEXIBILITY IN CARTONING AND CASE-PACKING, AS ITALIAN MANUFACTURER CAMA SHOWED DURING OPEN DAYS AT ITS FACTORY THIS SUMMER. THE KEY IS ESTABLISHING THE MOST APPROPRIATE MECHANISM FOR BOTH CURRENT AND FUTURE APPLICATIONS. REPORT BY MICHAEL MADDOX.

**W**ell before anyone thought of putting a robot inside a packaging machine, manufacturers had devised a whole universe of systems to place packs in rows, one on another, to form a collation for loading cases, trays and even cartons.

Primary packs can be lowered, raised on latches, placed one on top of another by luffing conveyors, brought together in the now common racetrack collator and then pushed, dropped or picked and placed by a robot, to mention just a few. Which is best is a matter for each application or, increasingly today, for a group of applications.

Robots score well for flexibility, but as Italian cartoning and case-packing machinery specialist Cama demonstrated at its open days this summer, the proven mechanisms of many years can be equally versatile.

"To reach the best solution for a customer you need a range of packaging machinery and robotics," says Cama managing director Daniele Bellante. "You may end up with three different solutions, each with slightly different benefits, but the important thing is not to start off with the idea that one route is necessarily better than another."

For example, when Cama was recently given the job of designing a line to load a variety of carton sizes with flow-wraps at the rate of 600 products a minute it chose to suggest a machine that relied on traditional collation and end-loading mechanisms.

"To use robotics on that installation would have added considerably to the price," explains Daniele Bellante. "In fact, the machine cost around 30 per cent less than a robotic solution."

However, it is now nearly 20 years since Cama built its first robot-based packaging line. This was delivered in 1988 to a French



**Summer demonstrations:** Cama put a variety of cartoners and case-packers through their paces

food processor and followed the now traditional format of conventional case or tray forming station, robotic top loading, and a separate conventional case closing station.

Its significance to Cama was twofold, as Daniele Bellante explains.

## Developing complete lines

First, it marked a shift in emphasis from building single machines to developing complete packaging systems although, today, the three stations of a traditional top load cartoning or case-packing line are often combined in a single monobloc machine, the first of which was built in 1998. Second, the top-loading robot employed was of Cama's own design and manufacture.

In 1993 Cama developed the first multi-belt pocket system for creating and carrying collations of products to the point of case or carton

loading and now spends 5 per cent of turnover on research and development, one recent development being a new high speed four-axis picking robot based on carbon-fibre limbs.

In addition, the company supports a project management department with specific teams dedicated to each installation, as well as a packaging design department able to create prototype structural designs for cartons and cases of every type.

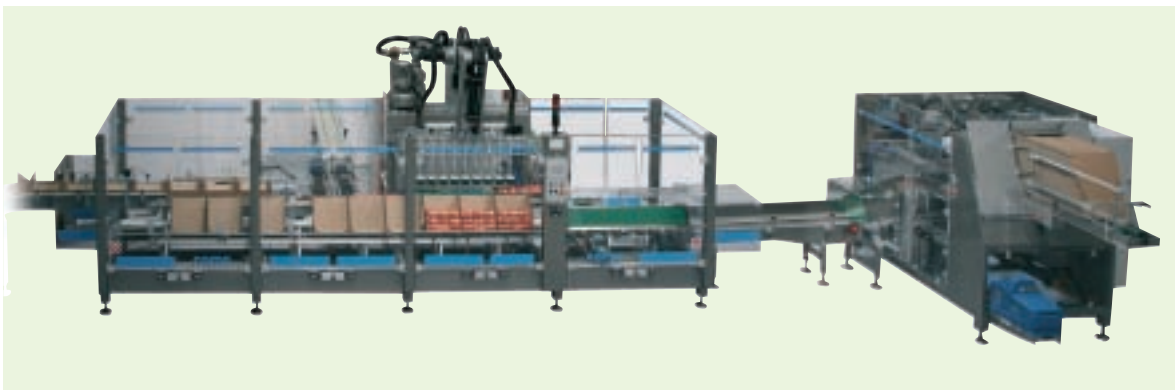
"It is very expensive to provide this sort of service," notes Daniele Bellante, "but it means we can keep ahead in each machinery segment – robotics and packaging machinery – and offer a variety of solutions.

"It also means that probably around 90 per cent of our competitors are German, rather than Italian manufacturers!"

Now with the company on track to a €30 million turnover next year – up from €13.5



**Loading block-bottom bags:** Above: Robotic pick-and-place section. Below: The complete line



**Barrel loader alternative:** Cama has developed an overhead unit that saves space on cartoners

million five years back – Cama is in sight of its ambition to be one of the three largest European manufacturers of secondary packaging machinery in the food and non-food markets.

Over the early summer, the company staged

a series of open days, demonstrating a variety of machines for both shelf ready case-packing and cartoning, in some examples with the flexibility to handle both.

Equipment to produce shelf ready display

packs included a line to handle block bottom bags from two vertical form-fill-seal machines and load the base trays with 18 bags at speeds up to 25 trays a minute.

Trays arrive from a conventional erecting station and are tipped 40 deg from vertical to accept the bags, which are loaded by a pick-and-place robot. This picks alternatively from two vertical race track collators set one behind the other and each fed by a bagging machine.

### One lid for two trays

Completed trays then pass to the lidding machine where a wraparound lid is created and glued in place. It is also possible to equip the machine to place a single lid over two trays, speeding the in-store shelf-loading process.

Daniele Bellante makes the point that the robotic solution provides flexibility for the

future, allowing the customer to upgrade the gripper arrangement and allow different shaped bags to be overlapped as necessary within the case or for products to be rotated to achieve the correct orientation.

“A robot might not be necessary if the degree of flexibility is different,” he says. “For example, the same machine has been built for another customer with a wraparound case-packer and conventional pushers in place of the robot, reducing the cost of that particular installation.”

However, the machine is still able to produce a two part lid and base pack, as well as a complete wraparound.

A second robotic machine on show combined the duties of a horizontal cartoner, and a counter display tray packer in a 10 metre long line able to handle the output of two 200-a-minute flow-wrappers.

A dual vertical race-track infeed is employed to load the cartoning section’s adjustable width infeed buckets with three, four, six or eight flow-wraps for end-loading in the conventional fashion.

However, vertical side extension plates for the buckets allow the robot also to assemble a 24 product collation in 4 x 6 format for end-loading into a display carton, which is pre-glued and perforated to allow the lid to be torn away at the point of sale.

## CARTONING AND CASE-PACKING

In place of the more usual barrel loader employed on end-load machines to push the product from the infeed bucket to the carton, Cama has developed an overhead unit, sitting above the carton chain. This keeps the machine narrow in format, allowing operation from either side with all points at which jams could occur falling within reach of the operator from front or back.

The entire line is electronically controlled and synchronised and so speed in the cartoning section adjusts automatically to the work rate of the robot.

However, for a machine to handle 600 flow-wraps a minute, end-loading a range of display packs with up to 36 products, Cama has avoided robots altogether. Instead, to build the collation within a vertical race track collator the multi-belt infeed from the flow wrapper is equipped with a luffing device that rises and falls to stack up to four flow-wraps in each pocket. A conventional pusher system then loads the cartons.

A further dual-purpose cartoning/case-packing machine demonstrated how different collations can be obtained by changing the point at which primary packs enter a vertical racetrack collator and how the use of a suitable side load

carton, with perforations for creating a display pack, can sometimes be a more economic approach than top-loading.

The machine has been designed to handle flow-wraps of two or three penny-stacked biscuits. These are fed from two lanes into the ends of two parallel racetrack collators, where the flights are horizontal, so creating collations on edge as the flights advance and become vertical or, alternatively, fed in between the flights once they have become vertical, retaining a penny stack format.

### Cartons and cases

The robot is then able to load the infeed buckets of a 170-a-minute continuous motion end-load cartoning machine while also being able to handle display trays or an RSC case.

The alternative was a top load carton, but as Daniele Bellante points out, another robot would have been required to turn the packs for the required range of collations, creating a "monster" of a machine.

Rather, the Cama solution offers a line with reduced footprint that can be run by a single operator.

Further cartoners exhibited by Cama included an end-load machine equipped with a

lubricant-free "bomb door" collator in which both halves of the door retract simultaneously to ensure that the large sachets being handled drop squarely on those below.

The machine has been designed to handle collations of three bags up to 190mm wide at speeds up to 350 sachets a minute.

On top of building cartoning and end-of-line machinery Cama set up a collaboration agreement in 2005 with the PFM Group company SPS Italian Pack Systems to provide complete product handling, primary packaging and final packaging on a turnkey basis for the biscuit and confectionery industry.

Typical of the equipment supplied so far is a complete system for a European confectionery producer, capable of accepting, spacing and flow-wrapping the product and then loading cartons of various types and product count at the rate of 120 cartons a minute.

Most recently Cama has announced plans to enlarge its manufacturing facilities and plans to start work next year on a new factory extension that will raise available floor space some 40 per cent, from 7000sq metres to over 10,000sq metres. ■

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# Creating the perfect *blend*

MIXING IS THE MOST COMMON PROCESS IN THE FOOD, PHARMACEUTICAL AND CHEMICAL INDUSTRIES AND ALSO THE ONE THAT CAN HAVE THE MOST DRAMATIC EFFECT ON PRODUCTIVITY, PRODUCT QUALITY AND ENERGY USE.

**O**ne reason for the complexity of mixing technology is that it embraces substances in all physical states and in all combinations of them. There are also a number of objectives.

For example, do you want to blend, disperse, emulsify, suspend solids or assist mass and heat transfer? Then there is the large number of variables, such as vessel size and shape and impeller type, size and speed, which can affect the results of the process.

Fortunately, the past decade has seen much development work on the computation of flow patterns in mixing vessels. As a corollary of this, mixer manufacturers have increasingly taken to computer aided design and manufacture (CAD/CAM) and introduced the principles of fluid dynamics into the design stage, so reducing the risk associated with building working models.

This has taken much of the 'black art' out of the process and replaced it with science, since computer modelling can also be used in matching the right mixer to a given process. Manufacturers can now be much more sure of their ground when discussing needs with the end user.

The result is more rapid progress in the decision making process and an increased likelihood of scale-up success. Unfortunately, it does not mean the need for trials is eliminated: theory aids choice and design, practice proves it. For this reason, suppliers with test facilities or loan machines are recommended for all but simple mixing tasks and especially for new applications.

Increased demand for bespoke processors is also driving developments. Fierce competition on supermarket, sweet shop and drug store



**Continuous processing:** Romaco FrymaKoruma's new plant for semi-solids such as toothpaste

shelves means constant product innovation, often with new and sophisticated formulae which may have properties requiring customised solutions. Many a mixer manufacturer will be prepared, at a cost, to help out, and eventually the lessons learnt from the exercise will filter through to that company's proprietary equipment.

### Payback for updating

As such, there is steady flow of new products and technologies being introduced to the market and the payback for updating the mixing process can be considerable – in terms of both efficiency and quality – if a more appropriate product or technology is introduced.

A new mixing processor is not, therefore,

only to be considered when a new line is to be installed or an existing machine has come to the end of its useful life. Perhaps more than any other part of the processing function, mixing should be subjected to a cost-benefit ratio analysis at regular intervals to determine whether the pay-back time for updating the process would justify the capital spend.

However, there are a number of criteria which must be considered when determining the right product for the job, the complexity of which will vary depending on whether the machine is a replacement or for a new product line.

Indeed, given the array of different mixing systems available – agitators, saw tooth blade, closed rotor, rotor-stator – and the number of variables that can affect the process, how does

one ensure the best solution for the job in hand? Assuming there is no professor of fluid dynamics readily available, or that the job is merely a repeat of an already successful application, the first stop has to be with the suppliers.

There are a number of established players which, as mentioned above, fund R&D departments and, given that an order could be in the offing, will offer access to them for tricky applications. Loan machines may also be available to test applications before making a purchase commitment.

The first consideration is configuration: do you need a batch or in-line mixer? Batch mixing is most common in the higher added value process industries where limited volumes are being produced, whereas in high volume chemical applications, for example, an in-line solution may be more appropriate.

An in-line answer may also be recommended if improvements to an existing process are being sought.

**Mixing action required**

The next major question is what type of mixing action is required? In general, for liquids of similar viscosities, low shear operations are the most appropriate, while for liquids of differing viscosities, high shear mixing may be necessary. Similarly, when particles are in suspension, it is likely that shear will provide a more uniform, stable product.

In the food, pharmaceutical and cosmetics industries, a common task is the creation of emulsions and for these a degree of shear is desirable in order to promote stability. However, forming a stable emulsion from a number of immiscible liquids, which may be of widely differing viscosities, while successfully dispersing and activating functional ingredients such as stabilising agents, can be a daunting task.

If solids are involved, will they dissolve fully and are any of the components heat sensitive? There is also a possibility that the shear force-generated could damage the components or the resulting emulsion.

According to Silverson Machines, conventional agitators can give satisfactory results across a broad range of viscosities in many applications, but their effectiveness tends to be limited to simple duties such as blending liquids of similar viscosities, maintaining in-tank uniformity and promoting heat transfer .

For more demanding duties, says Silverson, an agitator is, at best, only effective as a 'process aid', supplementing the action of

equipment with a more positive action. So for activities such as forming an emulsion or suspension, dispersion and hydration of powders – such as thickeners or stabilisers – and blending liquids with widely differing viscosities, another approach must be considered.

The company suggests that in the food, pharmaceutical and cosmetics industries, the chances are that a high shear rotor-stator mixer is the most efficient option for the more demanding applications. It argues that the advantages of the rotor-stator over conventional agitators stem from the multi-stage mixing/shearing action.

As materials are drawn into the workhead by the high speed rotation of the rotor blades, they are subjected to intense hydraulic and mechanical shear, then forced out through the stator at high speed and projected radially back into the mix.

Indeed, Silverson has developed a range of multi-stage in-line mixers to provide higher shear than its standard models, so giving lower particle sizes, finer emulsions, single pass processing and faster processing times. The mixers employ two concentric sets of blades and teeth running against two separate stators, an arrangement which Silverson says allows users to optimise mixer configurations to suit individual processes. Five models with power ratings from 2 to 60hp are available for capacities from 1000 to 100,000 litres an hour, based on product of water viscosity.

As material passes through the workhead it is subjected to increasing rates of shear. The inner rotor subjects the product to an initial mixing action, reducing the size of large particles and producing a uniform pre-mix.

The inner rotor also acts as the prime mover for the product, forcing it into the outer multi-bladed rotor-stator assembly where the greatly increased tip speeds and shear rates complete the mixing cycle by producing a completely homogeneous product.

The design of the multi-stage mixer is said to quadruple the number of shearing actions per revolution of the rotor, resulting in substantially faster mixing times by reducing the number of recirculation passes required. This also increases the number of products that can be processed in a single pass.

**Ultra-hygienic mixers**

Silverson has also just announced a series of ultra-hygienic in-line mixers, said to be the first of their type to gain certification from EHEDG

**Maximising effectiveness in powder mixing plant**

Since overall efficiency in powder mixing operations may well depend more on the time taken to fill, empty and clean the machine than actual processing time, a particularly flexible solution is to use an IBC as a detachable mixing vessel.

In this way, explains powder handling specialist Matcon, the tumble blending equipment is fully utilised, handling one IBC after another, with no dead time for formulation or cleaning. It also allows small volumes to be handled more economically.

However, mixing capability can be a limiting factor although, as Matcon points out, recent developments in IBC tumble blending – introduction of high shear, liquid injection and so

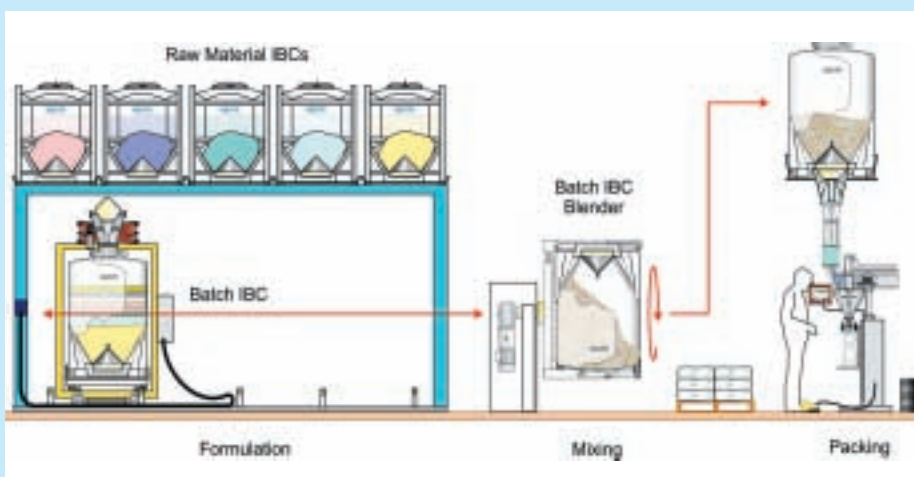
(the European Hygienic Engineering and Design Group) for hygienic construction and enhanced performance. Like other Silverson rotor/stator mixers, each machine can carry out a wide range of work including emulsifying, homogenising, disintegrating, suspending, dissolving, dispersing, blending, particle size reduction, de-agglomerating and reaction acceleration.

Features include interchangeable single or multistage rotor/stator arrangements as standard, resulting in substantially faster mixing times and finer particle size, says Silverson. The mixer's outlet can be configured to tangential self-draining or vertical self-venting positions as required, and the units also feature ultra hygienic single or double mechanical shaft seals.

Ytron-Quadro is now the UK supplier of vacuum mixing units from French manufacturer VMI Rayneri. Equipment includes the Trimix, which is said to allow the handling of complex rheologies in a single vessel, and can be supplied in versions suitable for vacuum or pressure. It is fitted with side-scraping mixing arms, a contra-rotating central mixing system and a bottom-entry high-shear homogeniser.

According to Ytron-Quadro managing director Dudley Bradley, the intensive movement in the vessel ensures a homogeneous mix and efficient heat transfer. Vessel sizes range from a 5 litre laboratory unit to 20,000 litres.

But the core Ytron-Quadro mixing range remains the Ytron Y directed jet mixer, the



**Minimising dead time:** IBC tumble blending for powders avoids cleaning and formulation on the mixer

forth – are broadening the scope of the process.

While there is no single answer for all processes, using multiple blending technologies and applying the 80/20 rule can produce a highly efficient and flexible process, the company explains:

“This would suggest using an IBC blending approach where it can be used and using an

alternative mixing technology – such as a high shear vertical mixer– where IBC blending may be less effective.”

Since fewer products would be used with the high shear vertical mixer, there would be less filling, less emptying and less cleaning required for both processes, giving the equipment much higher utilisation and effectiveness.



**Instantaneous shear:** Tools for the Ytron ZC powder incorporation unit

Ytron ZC powder incorporation unit and the Ytron Z in-line emulsifier. The latter can be used to process those creams and lotions which are either a water-in-oil or oil-in-water emulsion. The inline process, says Mr Bradley, produces a more consistent, superior quality emulsion in less time than conventional in-tank high shear mixers.

The single-pass processing also creates a more consistent emulsion, he claims, with longer shelf life and stability, since there is less likelihood of phase separation.

Dudley Bradley points out that when carbomer and polymer powders are dispersed as rheology modifiers or structure-building agents in personal care products, in-tank technologies will often produce insufficient shear to reliably reduce particle size and so-called “fish-eyes” or clumps of powder. Alternatively, processing times may have to be extended to ensure uniform dispersion. Quite apart from the cost and operating implications of this, he argues, over-processing may also reduce the effective viscosity of the product.

### Powders drawn down

Ytron-Quadro says that its Ytron ZC unit addresses these issues. A significant vacuum in the reactor housing, created by the interaction between rotor and stator, ensures that powders are drawn down into the reactor head. Here, particles are subjected to intense mechanical shearing prior to hydration into the liquid stream.

The Ytron Y is typically used in the batch dilution of “high active” surfactants. In a recent installation, two side-entry units were supplied to dilute 70 per cent sodium lauryl ether sulphate (SLES) in batches of 30,000 litres. Other applications can include the thorough mixing of colour into viscous creams, gels and lotions.

Meanwhile Romaco FrymaKoruma has turned its attention to continuous processing of semi-solids such as toothpaste, hair care products and mayonnaise and built a number of

## MIXING

different rigs, from pilot plants of 100-200kg/hour capacity to production plants of 1000-4000kg/hour.

In general, says FrymaKoruma, a continuous plant needs to have a production capacity above 1000kg/h to be efficient and cost effective. However, smaller production systems could be needed by the pharmaceutical industry, the company suggests, because of steadily increasing regulatory requirements.

"Once the process has been developed and critical parameters identified, the equipment can be monitored automatically, with lab testing reduced to a minimum. Residence times within the plant and correct sizing ensure that the required product quality and quantity is achieved, even when operating at less than 50 per cent capacity," the company points out.

"Realising that the potential to further raise productivity in batch processing is limited, we turned to the development of continuous processing as a logical alternative. The challenge we faced was in manufacturing equipment which would also guarantee process safety, dosing accuracy and consistent quality standards," explains Patrick Weisser, engineering manager for FrymaKoruma.

He says that to guarantee process safety, dosing accuracy and consistent quality standards, all important parameters are under online control throughout the process, with fully automated dosing and monitoring.

"After each step factors such as temperature, viscosity, flow rate, pressure, density and even pH value can be checked, with information continuously available on the operator panel," he explains. "If any parameter drifts outside the pre-set tolerances, the system will immediately and automatically stop for readjustment. Finally, data about the entire process is retained for the record or for analysis."

The new plant is said to offer users a high degree of flexibility in feeding active ingredients and additives, with the capability to introduce these at every phase of the process. It allows either one or two wetting steps and heating or cooling of the product, if required, while any entrained air is eliminated by a de-aeration process. Coriolis flow meters, accurate to  $\pm 0.5$  per cent, are employed for liquids while loss-in-weight feeders, also accurate to  $\pm 0.5$  per cent, are used for dry ingredients.

Mixed product is pumped to an inline homogeniser for final processing and fed into the finisher-skid where flavours or colours are added. It is then ready to be transferred to a

## High shear mixer handles fruit juice batches

Independent fruit juice blender David Berryman, Dunstable, has bought a Ytron-Quadro all-stainless high shear mixer, with stainless steel motor, to handle batches of fruit juice bases up to 1200kg with ingredients such as pectin, ascorbic and citric acids and preservatives.

The Ytron-Y ByPass machine is able to deal effectively with ingredients that include dry powders by the use of an integral feed chute that delivers ingredients directly to the mixing head below the liquid level.

This ensures ingredients are instantly wetted, suspended or dissolved to achieve an homogeneous mix. It is equally effective for both dry ingredients and liquids, even those of high viscosity, with the negative pressure created by the rotating mixer head helping to draw the ingredients into the mix.

Features of this Ytron-Y ByPass mixer are a special mixer head to help the high shear mixing action and a stainless steel motor from Marlin Stainless.

According to Ytron-Quadro managing director Dudley Bradley the Marlin stainless motor



**Stainless motor:** Ytron-Y ByPass all-stainless high shear mixer at David Berryman

is a 'natural' partner for his mixers. "With total corrosion resistance and no paint to flake the risk of batch contamination is completely eliminated. Being smooth bodied there are no crevices to harbour material, facilitating easy hosedown cleaning – which is no problem with the motor being IP66 rated."

Nick Eckert, managing director at David Berryman adds: "With everything we do hygiene is paramount. So this totally stainless mixer-motor package is an ideal solution. It performs really well, achieving effective mixing of all ingredients quickly and quietly and is easy to clean with a high pressure hose."



**Mobile mixer:** Custom unit built for E2V by Adelphi Coldstream

buffer tank, or sent directly to a filling line.

German manufacturer IKA has taken a modular approach which means that its series 2000 mixers are available in a range of sizes to suit most batch and continuous applications, including laboratory units. These use the same shear

zones found in all sizes of the machine, providing the opportunity for accurate scale up to production equipment.

The modules operate in a vertical position thus allowing complete emptying, are available with CIP and SIP capability and have FDA certification.

Represented in the UK by Bramigk & Co, IKA has also introduced its Master Plant, for emulsifying, homogenising, powder incorporation, dispersing and melting. Process times are reduced by the heatable/coolable spiral contra-rotating agitator, as well as by a jacketed vessel. High viscosity products, up to 100,000 mPas, can be processed without additional pumps and the working volume of

the vessel can be reduced by an optimised circulation loop, effectively reducing the vessel volume to 15 per cent of its total capacity.

Powders can also be incorporated without the need for a vacuum in the vessel, says Bramigk, while sizes range from 10 litres to 4000 litres

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and indeed beyond for bespoke designs.

Adelphi Coldstream, which specialises in bespoke mixing vessels, has recently built a plant for E2V Technologies to manufacture a co-precipitate of triple carbonate in an inorganic mix, achieving a certain particle size and shape for a specialised device. The mobile double heated vessel and mixer assembly consists of a 20 litre and 50 litre water jacketed vessel with lid mounted stirrers and a control panel for independently controlling the speed of both mixers and heating for each vessel.

### Stainless vessel range

A standard range of 316L stainless vessels are held in stock at Adelphi in volumes from 1 to 240 litres while bespoke mixing and storage vessels up to 1000 litres can be made.

CC Automation, which has recently become a PPMA member, is now supplying mixing systems from two German specialists, Miromatic and Novapac.

Miromatic builds MRA mixing and dosing systems for products such as yoghurts, probiotic drinks, fruit and savoury flavoured curds, mayonnaise and fresh fruit salad and has supplied most of the leading dairies including Müller UK, Danone, Campina, and Onken. The process avoids any shearing action, so maintaining the integrity of delicate particulates while the equipment is fitted with a sterilised duct for aseptic applications.

Novapac, which makes rotary cup fillers and horizontal form-fill-seal machines, also produces the Niromix range of homogenisers for milk, meat and vegetable products, pharmaceutical and personal care products.

A rotating blade cuts, mixes and emulsifies the products while a scraper rotates in the opposite direction and clears dead zones. Options include mixing performed under vacuum and preset temperatures, double walled with steam or hot water heating, formula management, weighing control and full CIP.

New from Grunwald UK is a stainless magnetic mixer and motor package that eliminates seals – and any risk of leakage – with the drive taken through the vessel wall to the mixing assembly by a magnetic coupling.

Introduced by Advanced Engineering (Mid-



*In-bin mixing:* Above: IMA Vima Cyclops system. Below: Syspal Euro-bin Tumbler



dleton), Rochdale, the Magnamix is suitable for vessels from 10 to 20,000 litres and employs an IP66 rated variable speed motor to allow cleaning via steam and high pressure hoses. The mixing head is self-cleaning and allows access for cleaning devices such as static sprayballs and rotary spray heads.

### Tumble mixing for food

Tumble mixing for powders is an established process within the pharmaceutical industry but Syspal has extended its use to food processing.

The company's Euro-bin Tumbler uses a standard 200 litre stainless steel tote bin as a mixing bowl and allows delicate products such as salads, pastas, cereals and vegetables, to be

handled with little or no breakage. The product to be mixed simply stays in the tote bin itself, reducing downtime for loading, discharging and cleaning.

Syspal says that feedback from several food processors has shown that the machine can reduce mixing time dramatically. In one test, with different coloured cooked rice, a single operator was able to mix a batch in less than a minute, compared with 10 minutes taken by two operators to complete the process by hand.

Pharmaceutical powder handling equipment from Italian manufacturer Vima Impianti is now distributed by IMA UK and includes dispensing systems, powder and tablet IBCs, bin blenders, column lifters, bin docking stations, transfer systems and various types of washing systems for bins and other components.

The Cyclops bin blender from Vima is described as a simple, flexible, compact, and efficient bin blending system that can be installed 'through the wall' with minimum intrusion in the processing room, so reducing the area to be cleaned and any risk of cross-contamination.

Mixing efficiency is said to be increased by a two-step reversible rotation, and by an optional dual blending inclination. A typical Cyclops installation is capable of handling batch sizes up to 1500kg including the IBC itself.

An alternative is the Vima Canguri bin blender, which retains the same through-the-

## MIXING

wall approach, but will operate with a customer's existing IBC designs. Batch sizes up to 2000kg can be handled.

For a slightly different approach, Vima also designs and manufactures the Hercules range of column bin blenders. There are two general models within this system: the Midi, which is capable of handling IBCs up to 600kg with top support anchor and 300kg as a floor anchored only installation, and the Maxi, which can handle IBCs up to 1000kg.

### Mixing via screw conveyor

However, vessels may not always be necessary for some mixing duties according to Spiroflow, which says its flexible screw conveyors – stainless steel spirals rotating within food grade plastic tubes – can be used to mix ingredients continuously and eliminate the need for conventional mixers.

Several components can be homogeneously mixed and conveyed at the same time says the company, both functions being achieved by the rotating spiral, at rates up to 40 tonnes an hour.

Individual conveyors can be provided for the components of a mix and may be arranged radially to feed to the main conveyor in which the mixing takes place. Alternatively, it is possible to install one conveyor within the rotating spiral of another, so that the material from the first conveyor is delivered into the centre of the stream of material in the second and the mixing action is enhanced. In either case material can be fed by weight or volume.

Spiroflow has a test centre where the relative

rates of spiral rotation for the different feeder conveyors can be established for different materials. These ratios can then be maintained through motor speed control inverters while memory in the control system enables changes from one mix formula to another to be made quickly. It is also possible to add a liquid ingredient to powder or granular components.

Spiral screw conveyors are typically accurate to  $\pm 0.5$  per cent, says Spiroflow.

Product transfer in mixing and blending processes often needs to avoid additional shear and so many equipment manufacturers have opted for the Maso Sine Pump which, apart from avoiding shear, is said also to offer smooth laminar flow, easier flow control through lack of pulsation during pumping, and accurate control of product flow,

Also, by changing speed, the pump can handle products that increase in viscosity during the mixing and blending process. Applications include food, pharmaceuticals, healthcare and cosmetics industries.

Finally, Watson-Marlow Bredel is launching its new 720 series of IP66 cased peristaltic pumps for general industrial metering or transfer duties. Said to offer a smaller footprint than other pumps with a similar flow rate, the new 720 series includes single channel flows up to 2000 litres an hour, or a maximum of 4000 litres an hour through two individual tubes.

The 720 pumps feature Watson-Marlow Bredel's LoadSure pumping elements which use industry standard cam and groove connectors to provide long tube life. ■

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For full details of all PPMA members able to supply mixing equipment, consult the PPMA machinery finder service, tel: 020 8773 8111, or visit [www.ppma.co.uk](http://www.ppma.co.uk)

## Bakery mixers for all applications

JBS Master Baker is now in partnership with Hollmec to market the Taiwanese Chanmag range of spiral and planetary bakery dough mixers throughout the UK.

A typical installation is at North Elmham Bakery near Dereham in Norfolk, where owner Norman Olley recently chose an 80kg capacity Chanmag spiral mixer to replace an old machine for rolls, bloomers and coburgs.

For high-output operations, JBS Process Engineering is the UK agent for Shaffer, the USA manufacturer of standalone mixers and fully automated, integrated mixing systems. Shaffer mixers are available with high-speed roller bar, and single or double sigma arm agitators.

Shaffer's latest product is the dough reclaim



*Dough mixer: An example of the Chanmag range*

slurry system, a process used to return normally discarded scrap back into the mixer, eliminating the costs of scrap and those of related handling.

# Integrated technologies give Boost to pneumatics

PNEUMATICS TECHNOLOGY IS CONTINUING TO DEVELOP ON SEVERAL FRONTS, SOME FOLLOWING WIDER INDUSTRY TRENDS, OTHERS MORE SPECIFIC TO COMPRESSED AIR ACTUATION AND INTEGRATION WITH OTHER TECHNOLOGIES. BOB DOBSON REPORTS.

To paraphrase John Donne: 'No technology is an island.' This is becoming more and more clear with pneumatics, which are integrating with complementary technologies to form mechatronic machine elements that are easily installed yet carry out sophisticated multifaceted functions.

Previously, pneumatic actuators were designed to provide linear motion or thrust. For this to be converted into useful work, such as operating a flow diverter on a conveyor belt, opening a gate or driving a hammer, one or more further mechanisms had to be added. This usually entailed the end-user – or a contract engineer – designing and making a bespoke element.

Increasingly, pneumatics manufacturers are relieving their customers of either some or all of this burden by providing actuators that incorporate guides, sensors, controls, cranks, levers, rack and pinions or other elements in plug-and-play units.

It also means that there is an increasing emphasis on product quality: a machine component or subsystem that breaks down in the field can quickly become a very expensive liability.

"This adds tremendous value for the suppliers, but that is not the real reason for going down this path," says Ray Barnes, managing director of Hoerbiger-Origa.

"Most manufacturing companies had no choice but to steadily reduce their in-house engineering capabilities through the 1990s and into this decade. So now they rely more and more on bought-in expertise. This allows them to concentrate on their core business and reduce their overheads. Where previously a pneumatics company could be just a product supplier, now there is a far greater need for technical support."

An example of the change is that electronics is now an integral part of practically all pneumatic systems, so that the once humble 'bang-bang' pneumatic cylinder has developed into a sophisticated actuator with positioning capability, speed control and so forth driven by a PLC, PC or fieldbus network. Many actuators now have either on-board controllers or plug-in interfaces so that they can be integrated into the machine control system in moments.

Similar developments are seen with on-board sensors that can detect many different types of

our designers decided to make the actuators so strong that they could be used as structural elements with machine designs. This was really radical thinking and as a young sales engineer I often felt like a magician, solving two or three problems for a machine designer with a single product."

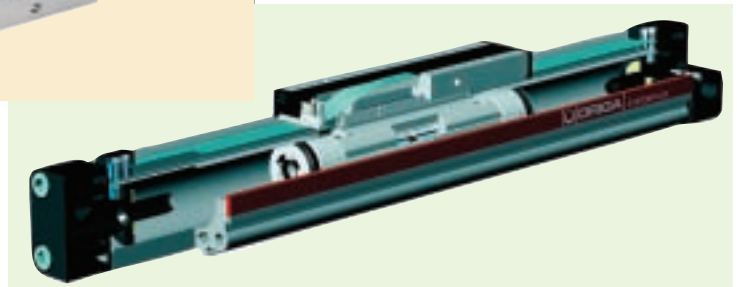
Another trail that Hoerbiger has blazed is in the development of electric actuators, as opposed to pneumatic ones. While the company can probably not claim to have invented the technology, its major contribution has been to make them completely interchangeable with their pneumatic equivalents.

It is unlikely, though not unheard of, that a machine requires such a changeover. The gain is that machine designers can develop a range of



**Above:** Fetso's new DGSL mini slide features an integrated design and is easier to install.

**Right:** Hoerbiger-Origa rodless cylinder can now be supplied with integral guides, bearings, sensors and other subsystems



operating and process variables. This information can be communicated back through the control system so that the actuator becomes an intelligent element within the machine, perhaps monitoring production processes or protecting itself from excessive loads and temperatures.

## Integrated with guides

Mechanically, actuators are now often integrated with the load bearing guides, which were previously separate items needing to be engineered into the machine. This is an area where Hoerbiger-Origa set the lead 20 years ago, as Ray Barnes explains:

"It was we who invented the rodless pneumatic cylinder and it is this sort of actuator that really benefits from integral guides. Early on

near identical machines offering different powers, speeds and accuracy by fitting pneumatic, electric belt or electric ballscrew actuators as necessary.

"This reduces the initial design effort, but the real saving comes in spares and stock holding," explains Ray Barnes.

The interchangeability is achieved by using the same extruded aluminium profile for the main housing of the actuator, the same mounting and same options for both pneumatic and electric variants. This can be particularly advantageous to machine builders who supply to customers around the world, where local stockholding can become a significant cost unless carefully managed.

While most of Hoerbiger-Origa's products

## COMPONENT MATTERS: PNEUMATICS

are of industrial scale, Festo is applying many of the same principles to miniature components. It has just launched a new generation of pneumatic mini slides that it feels are set to redefine the market for guided actuators.

The DGSL unit is based on a design in which the guide unit forms the actual body of the actuator and incorporates a high performance pneumatic drive. This fully integrated approach offers numerous advantages over conventional mini slides, including greater smoothness, higher end-position accuracy and inherent robustness, says Festo.

"A completely new body profile simplifies installation and commissioning by enabling all sensors to be mounted, adjusted and seen from just one position," explains the company's Steve Sands. "Thinking through how a product is installed and used, rather than just how it operates, is quite a discipline for the designers but the dividends in the field are enormous.

"They are suitable for a wide range of precision moving, pick-up, insertion and placement tasks, and integrate easily with other Festo automation components."

DGSL mini slides are available with stroke lengths up to 200mm. Each unit offers a wide range of

stroke adjustment which, combined with its exceptional rigidity and linearity, means that multiple slides can simply be 'piggy-backed' to create the desired motion characteristics. There is also a choice of eight actuator piston diameters – from 4 mm to 25 mm – and three types of damping option.

In all, the DGSL series offers 145 different models, making it very easy for system designers and machine builders to select an exact match for their application.

All DGSL series mini slides feature an extruded aluminium body, which mounts the guide unit and houses the bore of the pneumatic actuator cylinder. A precision stainless steel guide is coupled to the housing via ball cage bearings running along the guide rails, and is pre-tensioned to ensure smooth and reliable operation. The guide and the slide are pre-mounted and then ground in-situ, obviating any dimensional errors caused by the aluminium extrusion.

Thanks to the rigidity of the slide and yoke plate the new slide is said to realise a repetition accuracy of 0.01mm and offers linearity and parallelism within the 0.01mm range – even at maximum stroke. Furthermore, cage control is implemented using a patented rack-and-pinion arrangement which prevents any slip due to friction.

### Air preparation

While actuation is the more immediately exciting end of pneumatics, air preparation has not been forgotten either. Many manufacturers have introduced improvements to their filtering, regulating and lubricating technologies in recent months.

For example, Hoerbiger-Origa has announced a major expansion of its Airfit Tecno range

and convenience of the FRL system to applications that involve large air volumes.

Well suited for use in factory pneumatic ring-main installations, the Moduflex 80 range includes filters, lubricators and regulators, as well as a comprehensive series of accessories. Individual components can be quickly assembled in almost any combination, which is said to produce efficient, economical and easy-to-maintain air preparation systems, exactly matched to their users' needs.

A key feature of the Moduflex 80 range, in common with other products which make up the FRL system, is the use of Parker's novel Cliplok fasteners. These allow combinations of components to be assembled without the use of tools, in less than half the time needed with conventional systems.

The Cliplok system also eliminates the need for extra items such as pipe connectors and, since the individual components mount directly face-to-face without intermediate blocks, it produces exceptionally compact assemblies. Further, the Cliplok system allows individual components to be easily removed or exchanged, greatly facilitating maintenance.

These technical developments are often reflections of greater trends in wider industry. For instance pneumatics is doing its bit to reduce carbon generation and energy consumption, with simplification and ergonomic designs driven by users needs for greater productivity and flexibility.

Ray Barnes at Hoerbiger-Origa, has one final thought for the future of pneumatics users:

"For ten years or more we have seen machine building moving to the new low wage economies of the East. But their wages are now catching up, while we are developing automation and machine systems that reduce labour content. Also consumers are increasingly concerned to buy locally produced goods, thus reducing transport miles and increasing the need for production machinery." ■



**Air preparation:** Parker is evolving the design of the once humble FRL – filter/regulator/lubricator – with the Moduflex 80 range

of intelligent proportional press control valves.

Airfit Tecno combines piezoelectric technology and precision miniature component engineering which is said to completely redefine user expectations for speed and precision of air pressure control.

The piezoelectric control means the range is able to offer high dynamic performance, with such small power consumption that sparking generation is physically impossible allowing it to be used in Zone 1 rated explosive environments. Similarly there is no heat generation.

Full range pressure regulation is achievable for 0 bar to full flow, which coupled with its quiet operation makes it ideal for medical applications. Rapid cycling, ease of installation and compact size are further characteristics of Airfit Tecno.

At the other end of the scale the latest addition to Parker Hannifin's innovative Moduflex modular air preparation system is the new Moduflex 80 range. This extends the versatility

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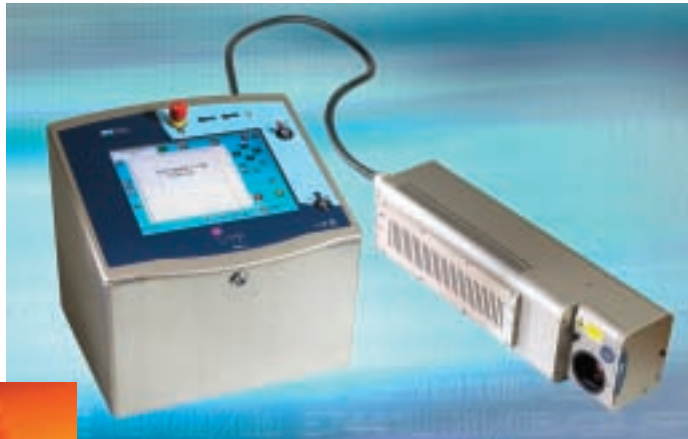
# Laser coder wavelength is tuned specifically for PET

Imaje has extended its range of third generation CO<sub>2</sub> laser coders with the 7031S vector model, specifically designed for coding onto PET using a specific wavelength.

“Standard lasers use wavelengths of 10.6 microns, which actually engrave the bottle,” Imaje explains. “The 7031S has a wavelength of 9.3 microns, which enables the beam to stay on the surface thereby keeping the PET intact and preserving the mechanical characteristics of the bottles.”

The lower wavelength also uses less energy, creates less dust and is said to create greater contrast on the marked material.

Imaje points out that the code created by standard lasers is only visible as a result of light interacting with the engraved mark. However, the 7031S beam stays on



**Laser for PET:** Imaje 7031S uses a shorter wavelength than usual

the surface and results in a change of colour, to slightly off-white, making codes easier to read, irrespective of whether the bottles contain light or dark liquid.

The 7031S laser is able to code up to 1333 bottles a minute and, with a tolerance of ± 10mm between the printhead and the bottles, different sizes of bottles –

330, 500 and 1000ml – can all be marked on the same line.

“This focal distance tolerance also compensates for problems resulting from product vibrations and movements while on the conveyor and ensures consistently high quality, high-contrast marking, even where condensation is present on the bottles,” says Imaje.

T: 01928 599420  
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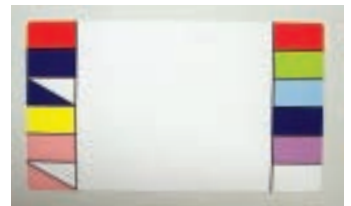


LOGOPAK INTERNATIONAL

## Print-apply units identify tote bin contents for Boots' stores

Boots' new warehouse in Nottingham has installed seven Logopak 515T print-apply labellers to identify the contents of tote bins carrying pharmaceuticals, cosmetics and so forth to its retail outlets.

The machines are using coloured polypropylene labels to identify the day of despatch or, in the case of lines running at relatively low output, labels with lines of six blocks of colour – one for each day. Five of these are overprinted as appropriate as the rest of the label is printed, depending on the particular day of the week.



**Day at a glance:** Pre-printed colour blocks are used on the labels

This simple “harlequin” approach – devised initially by Logopak for other industries such as brewing in which simple day identification is required – eliminates the need for daily reel changes.

At the warehouse goods are picked and placed into plastic totes carrying their own permanent bar code which is identified to the warehouse management system by scanning at the time of loading.

As the totes approach the labelling station, the permanent bar code on the tote is scanned, the data sent to the warehouse management system and details of the label data to be printed sent back to the Logopak 515T real-time print-apply labellers.

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ATWELL SELF-ADHESIVE LABELLERS

## Applicator duo give sushi branding and tamper evidence

Two pressure-sensitive applicators, purpose built by Atwell, are allowing Gunstones Bakery, Sheffield, to label three different sizes of sushi packs with a single composite label that runs across the base and up two sides, securing the lid to the base and providing tamper evidence.

Each system incorporates a bespoke conveyor built from stainless steel and other food grade materials, along with a base mounted 250mm wide AL250-S

programmable stepper-driven labelling head fitted with a Markem thermal transfer printer.

This particularly wide head allows the labels to be carried long edge leading on the reel, for application to the base of the packs

followed by wipe-up either side. A motorised head gripper ensures the product is held positively during the labelling process.

Due to the stiff nature of the composite labels used, the label path has been altered and



**Wipe-up labelling:** Branding and security for sushi

additional idler rollers employed to avoid risk of delamination before application, while additional label head supports were added to make sure the systems did not flex in use.

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# TOTAL SHOW REPORT 2

CONCLUDING OUR REPORT ON NEW DEVELOPMENTS AT THE TOTAL PROCESSING & PACKAGING EXHIBITION IN MAY.

## LOCK INSPECTION SYSTEMS

### High frequency metal detector sets itself to the product

The MET 30+ 3f/hf automatic triple frequency metal detector introduced by Lock is said to be capable of high accurate inspection of goods packed in both film and metallised materials.

It has an in-built automatic frequency selection facility, which chooses the optimum frequency whatever the product or packaging. High frequency is selected to inspect dry foods such as cookies or snackfoods at 875kHz - four times higher than standard food industry detectors.



**Multi-frequency:** Conveyor mounted Lock MET 30+ 3f/hf metal detector

The MET 30+ 3f's in-built automatic product set-up facility eliminates time spent configuring the detector and ensures consistently high performance, says Lock. It has settings for up to 100 products.

High frequency electronics are also now incorporated in Lock's MET 30+hf Atex approved vertical fall system, offering dry ingredient manufacturers up to 30 per cent higher sensitivity than standard detectors, says the company.

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lockinspection.co.uk

## ENDOLINE MACHINERY

### Compact robot case-packer combines proven machines

Total saw the first public demonstration of the Versapack compact robotic case-packing machine produced as a result of co-operation between case-handling specialist Endoline and robot manufacturer Quin Systems.

Applications include flow and roll-wrapped biscuits, wet wipes, ready meals and cartons.

The machine consists of an Endoline 220 case erector on which the Quin Rtheta picking head and a product infeed conveyor are mounted to give a particularly compact footprint of 1800 x 1750mm.

This is because of the speed of the picking head – up to 100 a minute depending on product weight and case size – which allows output to be maintained by picking columns rather than the entire case layers required for many pick-and-place units to achieve a reasonable speed.

The result is that a simpler and smaller product collating area can be used, with no need for multi-lane collation.

A further advantage in picking column by column is that products such as sachets can be easily overlapped to achieve a much

tighter fit within the case.

In addition, the use of existing technology also saves space, points out Mike Webb, managing director of Quin Systems. "For example, the reliability of the dual opposing vacuum case opening system on the 220 erector means there is no need for a buffer, which means a smaller footprint."

Endoline managing director Tony Hacker says: "Unlike traditional combined machines designed by specialists in either case-erecting or case-loading, we believe the new system is unique as it is designed jointly by two of the

## AUTOMATED PACKAGING SYSTEMS

### Bagging system suits IQF and other washdown applications

The FAS SPrint pre-made bagging system launched in the UK by Automated Packaging Systems is aimed particularly at the food industry and other packing environments that require fast changeover and daily washdown procedures.

This includes IQF products and those that are delicate or need orientation, such as lettuce.

Built in stainless steel and sealed to IP65, the system operates with bags supplied on a web, automatically separating, pitching, and opening the bags ready for loading by hand or automatic equipment such as weighers or fillers.

Speed is up to 120 bags a



**Designed for washdown:** FAS SPrint pre-made bagging system

minute and loading areas 1500mm wide can be supplied for up to two operatives on both sides of the machine.

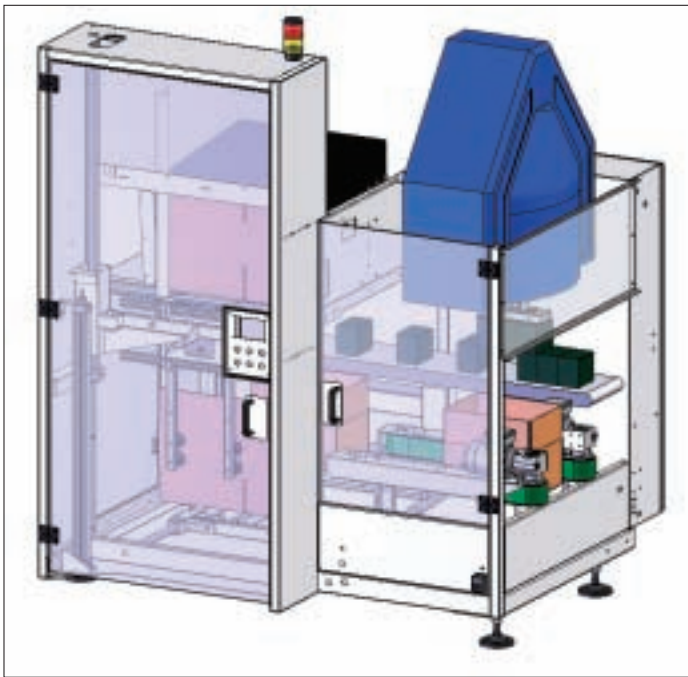
The flexibility provided by the machine – which is readily relocatable – makes it well suited to operations that demand different bag sizes and frequent product changeover and that have

varying weights of produce in the same bag, says Paul Hayden, marketing and commercial manager at Automated Packaging.

Set up for a new bag size takes about 2 minutes while the entire bag transport system can be tilted 90 deg for cleaning.

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**Minimum footprint:** Versapack requires no accumulation space

leading companies in both fields."

Speed of the Versapack is up to 20 cases a minute.

The Rtheta pick-and-place system has just two axes of freedom which, points out Quin Systems, means that the arm itself, free of joints, is lighter, more rigid than other picking robots and

able to operate at higher speed.

Drive is direct from two servo motors which not only eliminates any risk of positional errors due to backlash, but also greatly reduces maintenance. Repeatable accuracy is said to be better than 0.1mm.

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#### INTEGRAPAK

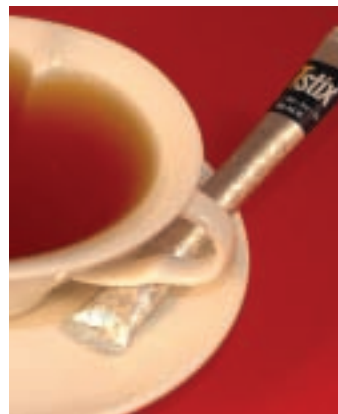
## Stickpacks with perforations to challenge teabags

A stickpack alternative to traditional teabags – which doubles up as a spoon for stirring – was launched on the UK market by Integrapak, recently appointed British representative for the complete machine and materials system.

Called Tstix the packs are made on multi-lane stick-packing machines supplied by German manufacturer Schwarze-Automation using a three-layer laminate with a pattern of micro-perforations.

This allows the sticks to be used for leaf tea or instant coffee – preferably freeze dried – as well as herbal infusions and instant tea.

After use the sticks can be lifted



**Perforations:** Tstix provides a stirring alternative to teabags

from the cup without dripping, since the grains of tea or herbs swell and close off the perforations.

Schwarze-Automation is currently developing a new metering unit for its stick-packing machines, allowing them to handle products that are not free-flowing, or are particularly light.

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#### LOGIC TPS

## Bottle unscrambler requires no size parts

An unscrambler that requires no size parts to handle bottles, tubes and tubs up to 100mm diameter at speeds up to 120 a minute was demonstrated by Logic TPS, which also showed a new ultra clean design of modular conveyor developed particularly for contract packers serving the pharmaceutical industry.

The Extreme Sortstation bottle unscrambler is said to be a particularly cost effective system and consists of a series of channels onto which bottles are fed by the elevator, aligning them immediately in one axis.

A revolving wheel then lifts the bottles up on pins towards the top of the

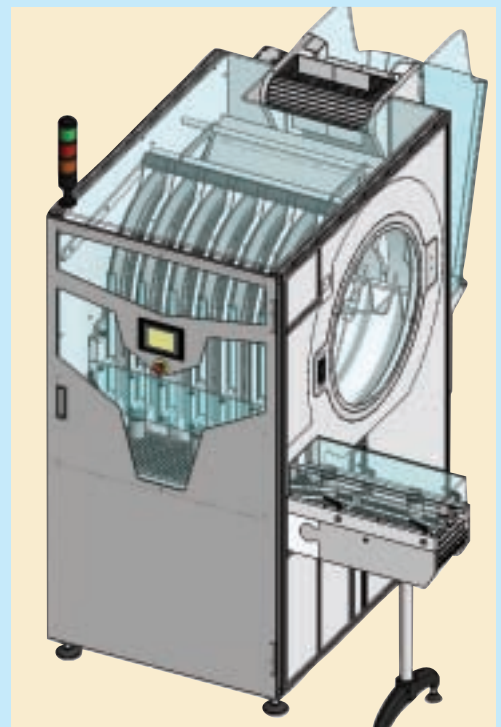
machine. The pins enter the necks of those bottles in the correct orientation, carrying them up and over centre to the adjustable V-plates of the outfeed.

Those containers in the opposite orientation, and so propelled from their base, tumble back under gravity into the channels at the bottom of the machine and the process is repeated.

The new ultra clean Extreme Jig-Saw conveyor was developed initially by Logic TPS for a contract packer to provide a modular system with zero

opportunity for tablets to become trapped and become rogue products after changeover.

Construction is modular, in FDA approved materials, with conveyor support lengths of 500mm, 1 and 2 metres linked via a male and female 'jigsaw'



**No size parts:** Extreme Sortstation unscrambler operates at speeds up to 120 bottles a minutes

joint. The conveyor belt runs in a crevice-free trough at the top and within a sealed return underneath.

Removal of the conveyor belt requires no tools and is achieved via a simple pin-locking system.

Drive is by inverter motors while integral service trunking is built into the body of the conveyor for electrical and air supplies.

Each section has an outlet port through which services can be accessed.

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**Total Report 2 continues on page 66**

IWKA PACSYSTEMS

# High speed feeder can link to multi-station magazine

Recently appointed UK representative for RonTech, the Swiss manufacturer of feeders for flat products such as cards, sachets and credit cards, IWKA PacSystems demonstrated a high speed friction system coupled to a multi-station turret magazine and a new budget friction model.

The Revolver automatic magazine extends substantially the interval between replenishment by carrying 16 trays of items to be fed around an indexing turret. As one tray is exhausted, so feed from the next is taken up to maintain a constant stream of product to the feeder.

At Total the machine was shown linked to a RonTech MF-Servo friction feeder. This is able to run at speeds up to 160 metres a minute and incorporates a system of gentle vibration at the back of



**Automatic magazine:** Revolver carries 16 trays of items for feeding

the magazine as an aid to ensuring clean separation of sheets for presentation to the rollers.

IWKA PacSystems also demonstrated the new Compact CoF, a budget priced friction feeder capable of speeds up to 100 metres a minute. Both feeders are equipped with a quick tension device, which ensures the rollers wear uniformly, reducing maintenance to a minimum.

Further feeders from RonTech include suction drum and pick-and-place models for handling filled bags and sachets, CDs and completed mailing envelopes, rotary feeders for newspapers, magazines and single sheets up to A3 and sliding feeders for products over 5mm thick such as small cartons.

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FJ PISTOL MACHINE SERVICES

## Standalone blister pack inspector runs at 300 a minute

A standalone off-line inspection station for sealed blisters, able to check both sides of the pack at speeds up to 300 blisters a minute was introduced by FJ Pistol, UK representative of the German manufacturer Scanware Electronic.

It is aimed in particular at situations where, for a variety of reasons, an entire batch may need to be re-inspected.

Fed from a vertical magazine, the machine can be equipped with the Scanware Lynx-Spectra colour vision system to inspect the contents of the blister for product presence, shape, colour, area, surface defects and incorrect location in multiproduct packs.



**Inspecting the lidding:** One of the cameras on the Scanware machine

On the lidding side, print quality and code accuracy is simultaneously checked via OCV and a greyscale camera, including lot dates, expiry dates, and all kinds of single and 2D codes. Some 24 different reading areas are definable.

The machine also includes a reject counter and verification system.

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SELO UK

## Filled bread roll line and reclose system for pillow packs

An automatic line for producing filled bread rolls at the rate of 60-100 a minute was shown operating by Selo, demonstrating the company's experience in creating lines of this type for the food industry.

There was also a new reclosable seal system operating on an Omori flow-wrapper.

The bread roll filling and packing line consisted of four machines linked by conveyor, each operating on an on-demand basis.

Rolls are first fed through a Selo slicing machine that makes a three-quarter depth vertical cut

allowing a sausage to be placed and mustard or mayonnaise to be added via a Depo K3 depositor.

Rolls then progress to an Omori Pa-2605 compact inverted flow-wrapper and finally pass through an Anritsu X-ray machine.

Selo has recently also completed a fully automatic line for preparing ham and cheese rolls at the rate of around 60 a minute.

It consists of an infeed and positioning conveyor, cutting station, top removal and manipulation section, slicer with automatic feed for the blocks, cheese-ham depositing conveyor, and top replacing unit.

As an option, lines of this type can also be equipped with a butter spreading unit.

In addition, Selo used Total to demonstrate a new reclosable

pillow pouch system on the Omori S-5000A flow-wrapper, capable of speeds up to 300 packs a minute.

As the film unwinds the system die-cuts a crescent-shaped slit and covers it with a peelable pressure sensitive label. To open the packs consumers simply peel back the label — also used for reclosure.

The machine was shown set up for unsupported meat or cheese slices with a polycord conveyor that runs into the forming box and delivers the product securely onto the film.

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