

PPMA

Machinery **UPDATE**

The only 'machinery only' journal for processing and packaging



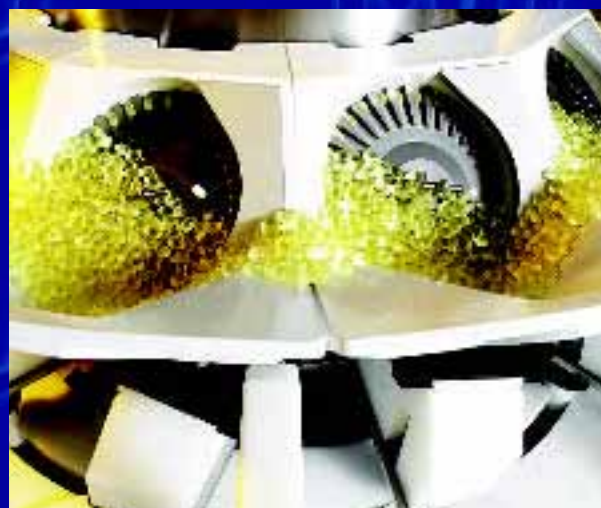
READY MEALS

Short run capabilities



BULK FILLING

Cutting heavy manual lifts



COUNTING

Flexibility and speed combine

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Machinery UPDATE

THE JOURNAL OF THE PPMA

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sponsored by
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Cutting red tape

For ten years successive UK governments have attempted to reduce bureaucracy and find better means of regulating manufacturing industry. Some ways in which this has been manifest, as you might imagine, have been more evident than others!

However, the Hampton review – published in March last year – together with the Better Regulation Commission's report *Less is more* and the formation of the Cabinet Office Better Regulation Executive have made the past few months a good moment to engage with the regulators on the subject of reducing red tape.

As a result, the PPMA has been working with other members of the Engineering and Machinery Alliance to put the UK mechanical engineering industry's case for simplified regulations, particularly in employment, as an aid to improving productivity in decidedly tough international trading conditions.

My experience when working with the Cabinet Office Better Regulation Executive was that UK firms are not intrinsically averse to regulation but, rather, they recognise the need for appropriate regulations and can be very positive when these are clear and well targeted.

But disproportionate, poorly conceived regulations that clearly have no direct impact on the ills they are meant to address, give regulation and those associated with them a bad name. What it boils down to is an urgent need to reduce unnecessary expenditure and, in some cases unintended consequences.

For instance, to quote the technical director of a typical medium sized engineering firm: "As with so many of these schemes, we all support the declared aim as they are generally worthy. It's the cumulative pressure. Every six months there's some new requirement, working at height, a new directive on biodegradable detergents changing the nature of the tests required and widening the scope, and so on and so on."

Then there are unintended consequences, such as the £20,000 a year one firm spends analysing and recording its use of packaging, largely incoming wooden crates which are subsequently re-used for storage and distribution. Not unreasonably, the company remains quite baffled as to how its substantial clerical effort is helping the environment.

In its submission to the Cabinet Office, the Department of Trade and Industry and the Chancellor of the Exchequer, the Engineering and Machinery Alliance point out that the UK's 13,000 mechanical engineering companies may be spending over £430 million a year on red tape associated with employment, environmental reporting, health and safety and statistics.

The report demonstrates that on average, each company is spending over £33,000 a year on red tape and that there are ways to reduce this hefty chunk spent out of average sector company sales of £2.5 million.

Firms in the report say they believe that Government can begin to turn this situation around if it uses companies' practical expertise when drafting new regulations jointly with business, simplifying the forms it sends out, and cutting down the number of regulators.

Is government listening? I think so. Has the demise of manufacturing in the UK finally rung the Whitehall alarm bells? We shall see, but I remain hopeful.



Chris Buxton

Chief Executive, PPMA

EXHIBITIONS

New exhibition to serve food and drink processing and packaging

The PPMA is to help stage a new exhibition for food and drink processing and packaging, to be held for the first time on 18-21 March 2007 at ExCel, London.

Organised by Fresh RM, which runs the IFE and Hotelympia shows, Pro2Pac follows the Foodex@IFE exhibition held for the first time in March last year.

"The event showcased suppliers of food and drink processing equipment, technology, machinery, systems and solutions alongside IFE and succeeded in attracting more than 13,000 visitors," says Sue Woodward, exhibition director. "We wanted to build on this success so we have combined our food processing exhibitors with the popular packaging section from IFE to create a brand new show, Pro2Pac."

Chris Buxton, chief executive of the PPMA adds: "PPMA's involvement with Pro2Pac recognises our continued efforts to support equally both our process members as well as those involved in packaging machinery."

The PPMA will have a significant presence at Pro2Pac with a member's pavilion and lounge at the heart of the show.

In addition to exhibiting companies, visitors will also be able to view a central exhibition feature, Future@Pro2pac, organised jointly with the Packaging Innovation Show. This will showcase innovative packaging and processing solutions for the food and drinks industry, with a focus on future trends.

The innovations zone is also a central feature of the Packaging Innovation Show to be held within the Total Packaging and Processing Show in May 2007 at the NEC.

THE PPMA SHOW

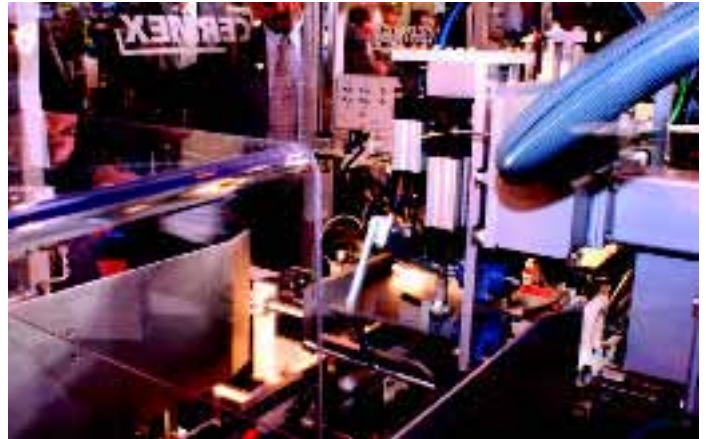
PPMA Show 2006 to reflect success of last year's event

The success of the PPMA show last year is being reflected in strong sales for the 2006 event this September, according to joint organisers, the PPMA and Reed Exhibitions UK.

"The show is already over 70 per cent sold and there are no signs of that slowing," reports exhibition director Ian Crawford.

"We are committed to ensuring that the show continues to develop in response to current market needs. With that in mind we have made a number of developments for 2006."

Perhaps the biggest development for the PPMA Show in 2006 is the move to Hall 5 of the Birmingham NEC. Hall 5 is the largest of all the halls and is larger than the previous halls occupied by the show put together. It also



The PPMA Show: Visitor friendly with the accent on working demonstrations

means a better visiting experience, points out Mr Crawford.

"Moving to Hall 5 is a great step for the PPMA show," he says. "Having the whole show in this hall means that visitors will be able to find the companies they want and exhibitors will have a far

better chance of doing business."

New developments for 2006 also include a Materials Village that will allow visitors to sample the latest packaging materials.

The PPMA Show 2006 takes place 26-28 September. Further details: www.ppmashow.co.uk.

ORDERS AND INSTALLATIONS

£4 million syringe line assembles 400 a minute

Scottish assembly automation specialist AGR Automation has designed and built a £4 million system to make a nine part plastic medical device – spring loaded Penneedle syringes used by diabetics who inject insulin.

The new line – said to be the first of its kind built anywhere in the world – is able to produce 400 devices a minute and was shipped to the Scandinavian customer towards the end of last year.

"This assembly line demonstrates our capability to take shed loads of our clients' plastic injection mouldings, and assemble and package them as complete devices," says

AGR sales and business development manager Lawrence Davie.

"We have supplied similar systems to Irish and Italian clients in recent years, but this machine is much more complex as it integrates several proprietary technologies including laser welding, vision systems and in-line application of a paper seal."

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Print-apply system handles 1 million pallets

A Logopak 820PF pallet labeller at soft drinks filler AG Barr has now handled over 1 million pallets – each with two labels – according to Logopak International which supplied the machine in 1993.

"This 820PF is one of the oldest

of that type in the UK and AG Barr has no intention or need to replace it in the foreseeable future," says Logopak International general manager Wilson Clark.

T: 01904 692333

E: salesonweb@logopak.net

PEOPLE

Chief exec for Bradman Lake

Simon Wheatley (right) has been appointed chief executive of the international Bradman Lake

group. He joined Bradman Lake in the UK as sales and marketing director in March 2003.

Stuart Ralph has joined Cap Coder as sales and marketing manager.



From risk assessment to retail ready packaging

Machinery risk assessment and retail ready packaging are the next subjects to be tackled by PPMA technical seminars, followed by a health and safety course for maintenance engineers.

Machinery risk assessment: 16 March 2006. Almost every enforcement action taken by the HSE following a machinery accident carries the words:

“Failure to carry out a suitable and sufficient risk assessment”.

Risk assessment is a specific requirement of the Management of Health and Safety at Work Act, the piece of legislation that includes the overall duty of an employer to protect employees and others who may be affected by the employer’s activities.

So what is required, since many people are familiar with task-based risk assessments, but are often unsure how to carry out the kind of detailed risk



Course sponsors: Technology courses are sponsored by Elau and those concerned with regulations by Pilz



assessment that is required for machinery, process plant and assemblies of equipment?

This training day will give delegates practical hands-on experience of machinery risk assessment using structured techniques based on European standards. It is aimed at both engineers who want to learn to carry out risk assessment as well as safety professionals.

Retail ready packaging machinery: 27 April 2006. The demand from supermarkets for products to be provided in shelf ready packs is prompting most fmcg manufacturers not only to re-evaluate their transit packaging, but also the

equipment they use for end-of-line packaging.

Supermarkets have been using a number of conferences to tell brand managers what they want, but how do production managers and engineers deliver? What are the options with equipment to create shelf ready packs, such as wraparound machines, top loading systems, end-load machines and tray and lid systems?

Few companies have the luxury of being able to despatch their products in one pack style or of knowing that their one pack style will be acceptable to all their customers indefinitely. So this course will also pay particular attention to selecting machine systems that can produce several pack styles.

Health and safety legislation for maintenance engineers: 18 May 2006. Most maintenance and service engineers are well aware of the hazards associated with the work they do, but are much less

sure about the wide range of legislation that regulates their work.

This knowledge gap can leave both

engineers and their employers vulnerable, particularly since engineers are frequently the only people in a company with the technical training to judge if equipment does or does not comply with legislation.

This course is designed to give delegates a thorough grounding in the key items of legislation that affect the work of maintenance and service engineers, explaining the main aims of each regulation and providing checklists for their essential requirements.

Further information on PPMA 2006 training courses and seminars from John Cowdrey: 020 8773 8111, john.cowdrey@ppma.co.uk

PARTNERS IN PACKAGING

Compact robot top loads cartons with confectionery

German top-load and cartoning machinery specialist Vepatec – represented in the UK by Partners in Packaging – has built a simple, compact robotic system to give a local confectioner flexible automatic cartoning for Praline bars within a tight line space.

Fed from an upstream flow-wrapper, bars measuring 190mm long x 15 x 15mm arrive at a Vepatec SpeedTrac racetrack collator at speeds of 270 a minute and are grouped into layers of four.

A Unigrabber pick-and-place robot equipped with four pick-up heads, each picking and placing a layer of four bars, takes the bars from the SpeedTrac and places them in a top load carton which is erected by a Vepatec 190S top load carton erector.

The line comes with change parts for a number of pack sizes including an 11 x 1 pack of 100g bars packed at 100 a minute.



Compact system: Vepatec top loading station for confectionery bars

Changeovers between pack sizes can be carried out by operators within 5 minutes, says Partners in Packaging.

The system is equipped with a Profibus linked Siemens control system and, says Vepatec, has significantly reduced the amount

of labour employed for the task.

Further labour savings have also been obtained by changing to a machine erected, die cut carton from the previously manually erected crash lock base carton.

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ISHIDA EUROPE

Weigher moves between bagging and tray filling to save cost

A new mobile weigher gantry devised by Ishida is now allowing Dutch meat processor Giebels Meat Products to alternate between bags and trays without the capital cost of providing a weigher for each line.

The installation is handling frozen spare ribs in weights of 500g, 750g or 1kg, and is based on a 14-head model from Ishida's EM economy range of weighers, fitted with 5 litre buckets to handle the slightly awkward shape of the product.



Serving two lines: The Ishida weigher can be moved in under a minute

To disengage the weigher from one line and roll it across ready for action on the other takes less than 1 minute. The gantry is fitted with an elevator, to bring the ribs to the top of the weigher, and has adjustable levelling feet, to ensure optimum weigher stability.

Speed of the installation for filling 500g of spare ribs is 80 packs a minute, and for 1kg of product is 60 a minute. Giveaway is said to be less than 1 per cent.

T: 0121 607 7700

E: info@ishidaeurope.com

CAP CODER

Starwheel capper handles range of caps and bottles

Cap Coder has supplied a CC 560 starwheel-based capper to Aurora Scientific to allow a variety of both sterile and non-sterile bottles and caps, supplied to the water industry, to be handled on a single machine.

For example, the CC560 indexes four times in a revolution to cater for 5 litre containers, or 16 indexes a revolution to cater for 25ml bottles, using a PLC-controlled servo drive.

The capping head is adjustable to suit the height of the bottle.



Versatile capping: Cap Coder CC560 handles a range of bottles and caps

However, the cap feed is at a constant height with the cap raised to the head for pick up by a vertical escapement which, says Cap Coder, greatly simplifies the cap-feeding mechanisms.

For speed, a twin capping-head arrangement is employed in which one head is picking a cap while the other is closing a bottle before swinging through 180deg to repeat the process.

T: 01865 891466

E: sales@capcoder.co.uk



SPRINGVALE EQUIPMENT

Retort pouch filler uses non-contact seal inspection

Spanish manufacturer Bossar has supplied a Polish food company with a purpose built retort pouch filling machine, one of the first in Europe to be equipped with a Predator non-contact top seal inspection system from Australian manufacturer Pak Tech.

The machine is being used to handle 500g and 1kg retortable packs of soup, some with particulates, at speeds up to 40 a minute.

Pre-made pouches are held in a magazine under constant pressure and placed in the correct position on the transportation system by a Pak Tech Motorman robot.

"The combination of the accuracy of the robot and accurate presentation of the pouch in the magazine ensures that the pouch is consistently placed in the same position," points out Bossar's UK representative Springvale Equipment.

Built in stainless steel, the



Loading by robotics: Pre-made pouches are fed to the walking beam

Bossar machine employs a walking beam for pouch transport and uses three separate mechanisms for pouch opening: Suction cups to open the top and bottom of the pouches; mechanical movement of the grippers to control the movement of the sides of the pouch during opening; and wedges that fit

the top of the pouch and inject compressed air to ensure the gusset is fully open.

There are two liquid filling stations and a stretching station prior to sealing to eliminate risk of wrinkling in the seal area. Sealing time is independent of machine speed and is carried out under high

pressure to expel any liquid contamination and minimise risk of micro-leakers.

After sealing the pouches are inspected by the Pak Tech Predator system which, unlike systems that operate by applying pressure to the pack and measuring any deflation for a simple pass or fail decision, is able to analyse the make-up of the seal area.

This means, for example, that any slow deterioration of seal quality can be trended and an alarm signalled before reject packs are produced. Equally, analysis of the seal area can help pinpoint faults with the sealing system itself.

The Predator is able to detect seals that are weak, incomplete and incorrectly placed using an ultra-violet light source, a fluorescing lacquer in the seal area at the back of the pouch and a clear strip at the front.

Unsealed areas appear darker under ultra-violet light, allowing the Predator's vision system to produce X-ray type images for analysis by the software.

T: 01420 542505

E: springvale@springequip.co.uk

KLIKLOK WOODMAN INTERNATIONAL

Sun Valley buys further display card loader for bags of nuts

Sun Valley, Bromborough, has installed its seventh display card loader from Kliklok Woodman to handle increased production of 11 different products, ranging from Roasted Cashews to Chilli Peanuts, in six different sized 25g and 50g bags, at speeds up to 80 bags a minute.

The display card loader is designed to attach bags to display cards automatically, for point of sale presentation, with no staples or glue.

Instead, the cards use a locking slot to hold bags firmly in place during distribution and display while still allowing the bags to be easily removed for sale.

The machine is based on two indexing conveyors, one feeding bags to a pick and place mechanism, the other delivering the display card to be filled. Sun Valley uses a card format of three columns, with four, six or eight packs in each.

T: 01275 836131

E: m.tatum@kliklok-woodman-int.com



ISOPAK

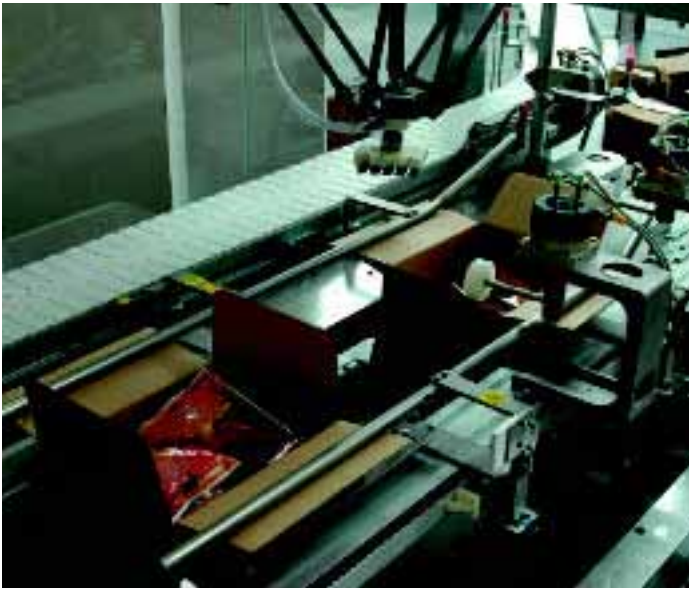
Capsule filler for small batches

The Specials Clinical Manufacturing, has bought a Dott Bonapace In-Cap laboratory scale capsule filler from UK representative Isopak, to handle products on clinical trials economically in batch sizes as small as 50g.

Installed at the company's new factory in Prudhoe, the automatic benchtop machine is said to be the smallest automatic filler of its type available and is capable of handling powder, pellets, liquids, jelly, tablets and gels. Maximum speed is 3000 capsules an hour.

T: 01780 410093

E: mail@isopak.co.uk



Handling heavy bags: Skinetta RobTeq Speed-Picker robot case-packer

LOGIC TPS

Customised robot case-packer handles heavy bags

Customised gripper heads and a modified trajectory have allowed a Skinetta RobTeq Speed-Picker robotic pick-and-place system to handle 1kg pouches securely for a case packing system supplied by the German manufacturer to the Swiss Co-op.

UK representative Logic TPS explains that the Co-op was looking for a faster and more efficient way of handling the distribution of powder and granular products such as sugar, coffee and baking mixes, in pouches up to 1kg.

"While the Co-op recognised the advantages of robotic case packing systems, it was originally thought that the centrifugal forces involved in moving such heavy bags would be beyond the capabilities of the suction gripper head of the robot and so the company was considering a more traditional case packing system."

However, Skinetta devised means of overcoming the effects of the inertia involved in picking the bags up and moving them at high speed into the packing case, using an ABB Flex-Picker robot.

First was an optimised suction system on the gripper head, with

different gripper arrangements to suit different bags to ensure they were held firmly while being moved. Skinetta also looked at ways of minimising the centrifugal force exerted on the bags and developed a special movement curve for the gripper head.

This combination provided the answer and a production machine is now installed at the Co-op's packing centre, from which stock is sent to five distribution centres serving around 1000 local businesses and shops.

Sales at these outlets are reported to the distribution centres and simultaneously to the packaging centre via an ERP system which plots the pattern of usage to ensure the correct goods are available to re-stock the shelves.

"Now, thanks to the flexibility of the RobTeq Speed-Picker, the packaging centre is able to react quickly to any unusual purchasing trends and get stock to the retail outlets when it is needed," points out Logic TPS.

Changing the packaging format only involves replacing the suction head. The robot is synchronised with the infeed conveyor and is able to load cases with up to 88 bags a minute, using a pattern programmed into the unit off-line using MS Excel.

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FOODEX MEATEX PREVIEW

THE FOODEX MEATEX EXHIBITION TAKES PLACE AT THE NEC, BIRMINGHAM, 19-22 MARCH.

AEW DELFORD SYSTEMS

Slicer copes with product variations

The PolySlicer Vision is said to set new standards in slicing cheese, cooked meats and chilled fresh product as a result of an advanced vision and laser system. This follows contours closely at the cutting face to detect virtually any variation in product composition.

As a result, holes in cheese, voids in ham, areas of fat and even lean/fat ratios can all be measured at the blade, slice by slice, to give high on-weights, and very low giveaway, with minimal manual intervention.

The machine is on demonstration linked to an IPL Robot that picks up single or multiple portions and loads them into trays or a thermoformer.

Further exhibits include the SmartSlice Vision+ automatic portioner for fresh or chilled boneless product, the Guardian 2200 multi-purpose checkweigher with optional integral metal detector, the 8100 weigh price labeller, and a selection of pressure-sensitive labellers.

T: 01255 241000

E: harwich@aewdelford.com

D2 FOOD SYSTEMS

Cook-quench-chill system

Packaging and processing equipment from D2 for convenience food includes a new low cost Vortex cook-quench-chill system.

Manually operated, the Vortex cook-quench-chill system has been designed specifically for potatoes, other vegetables and meat and is a



Digi Europe: HI-700 weigh-price labeller is to have web-based data handling

low cost version of D2 Food Systems' Vortex 2 machine, aimed in particular at pasta and rice.

In addition, the company is launching a new compact stainless steel Rama pre-glued sleeve, which can handle up to 50 packs a minute and adjusts for different size products without change parts.

There is also an Italproject end-of-line robot for loading cases and plastic crates as well as two Ulma medium and high speed tray sealers.

T: 01582 622111

E: sales@d2foodsystems.com

DIGI EUROPE

Weigh-price labellers

Digi Europe is showing examples of its weigh-price labellers and checkweighers, particularly the HI-700 weigh-price labelling machine of which 37 have been sold to Grampian Country Food for its chicken processing plants.

Installed at five different sites, the machines are working with a variety of packs and labels at speeds of 80 packs a minute and higher.

Digi is now working with Grampian to develop a web-based program for data collection, central



Espera Scales: ES 5000 compact weigh-price labelling machine

control of PLU data and label format information. This is known as 700.net and will be available to all users of the HI-700.

T: 01440 712175

E: sales@digi.co.uk

EASIWEIGH

Linear weigher and counter

The Midilite linear weighing system from Easiweigh is an entry level automatic weighing system said to be well suited to start up operations.

The system can also be operated manually if required and can handle a wide range of products under average or minimum weight settings.

Also shown is the new Easicount linear counter which can be fitted with up to 12 lanes and provide speeds up to 60 packs a minute. Frozen and fresh produce can be handled.

T: 01905 28075

E: sales@easiweigh.co.uk

ESPERA SCALES

Compact weigh-price labeller

The new ES5000 weigh-price labelling machine occupies less than 1200mm of line space and provides speeds up to 65 packs a minute.

An entry-level machine, the ES5000 is nevertheless said to be fully featured, with integral label design facilities, average weights capability, weight banding software and a 14in colour touch screen control.

Also being launched is a compact ES7000 catch weight 'C-Wrap' labelling system 2.2 metres long and capable of speeds up to 85 packs a minute.

Further exhibits include an ES7011 weigh-price labeller with top and bottom printers, capable of 120 packs a minute, an ES3105 manual weigh-price labeller and two examples of flash labellers, one wipe-on and one blow-on.

T: 0845 0567900

E: sales@espera.co.uk

T FREEMANTLE

Wraparound board sleeve

Freemantle's recently updated high speed wraparound sleeve is the principal exhibit from the company's range of cartoners and sleeving machinery.

Capable of speeds in excess of 100 a minute the machine is compact, can be changed from size to size in 6 minutes and will run a wide range of pack styles including full sleeves, watchstraps and bands.

It complements the company's range of preglued sleeves, which are also on show. Some 45 have been installed in the UK convenience food industry over the last three years.

T: 01724 276908

E: sales@tfreemantle.com

INDUSTRIAL WASHING MACHINES

Washing and sanitising

Three machines from the company's latest range of washing and sanitising systems for the food Industry are on show, all with enhanced hygienic design.

The new ECW Eurobin washing system can handle about 30 bins an hour while the EDi13 Cabinet Utensil Washer can now be fitted with a diagnostic 'Logibox' to record the temperatures and timings of wash and rinse cycles for HACCP analysis.

There is also the IWM San 100 sanitising system said to provide significant savings compared with dip tank systems.

T: 0121 459 9511

E: sales@indwash.co.uk

ISHIDA EUROPE

Complete line for meat in trays

The latest Retail Ready Line from Ishida covers the entire product portioning, weighing and tray packing process for fresh meat.

It includes a tray denester, two filling stations using a Marel OptiCut portion cutter, an Ishida weigher, checkweigher, tray sealer, metal detector, weigh-price labeller, automatic label inspection system and a pick-and-place case-packer.

Ishida is also using the weigh price labeller to demonstrate how

packaging machinery can be integrated into an overall Enterprise Resource Planning (ERP) system – on-line and in real time – using different interface protocols.

Further machinery on demonstration includes the Ishida R Series multihead weigher.

T: 0121 607 7700

E: info@ishidaeurope.com

MASO PROCESS PUMPEN

Pumps discharge drums quickly

The Maso Sine pump range provides rapid discharge for 200 litre drums of juice and juice concentrates.

It is said to have greater suction capability than rotary lobe pumps, to give faster transfer rates than air-operated diaphragm or rotary lobe pumps, and to be more economic to run than any air-operated diaphragm pump.

The pump can also be used for handling ready meals components, sauces with delicate particulates, cheese, deli products and confectionery ingredients as well as discharging road tankers quickly.

T: 01255 863932

E: gsanders@sundyne.com

PALS LABELLING

Print-apply labelling

The PLV print-apply and verification system is being introduced and can provide label application rates up to 150 a minute, with each label printed, and the print information verified, in real time.

Label data is downloaded to each machine via an Ethernet connection, while actual production achieved is uploaded to the main-frame computer. Twin labelling stations, with automatic change-over between each, provide continuous running.

The system was developed in conjunction with a major supplier of poultry and poultry based products,



Ishida Europe: The Marel OptiCut portion cutter for fresh meat

where a number of units are already in operation.

T: 0161 620 0236

E: sales@palslabelling.com

RIGGS AUTOPACK

Depositing and filling

Several models from Riggs Auto-pack's standard low level hopper range of depositors are to be seen.

These include a machine with a hopper using a gentle air operated agitation system to keep products in suspension and prevent bridging when handling products with large particulates such as stews and casseroles.

Further depositing and filling machines, including automatic conveyor based systems, are aimed at products including ready meals, sauces, mayonnaise based salads and jams and chutnies.

All are air operated and can be stripped down quickly for cleaning.

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SANDIACRE ROSE FORGROVE

Form-fill-seal for food

Sandiacre and Rose Forgrove, both part of Molins Packaging Machinery, are demonstrating stainless steel hygienic versions of their baggers and flow-wrappers.

From Sandiacre there is a TG250-RC high speed vertical bagger, fed by a high speed multi-

head weigher, capable of producing bags up to 250mm wide at speeds up to 200 bags a minute. Features include product-in-jaw detection.

From Rose Forgrove comes the Merlin HSE flow-wrapper able to handle a wide range of products ranging from individual bars a few millimetres wide up to family cakes and pizzas 300mm wide and 160mm high.

T: 0115 967 8787

E: sandiacre.uk@molins.com

SPIROFLOW

Bulk ingredients conveying

Dry bulk ingredients conveying and big bag handling systems are featured, including flexible screw conveyors, aero-mechanical conveyors, FIBC filling machines and dischargers.

Product containment and compliance with the ATEX (DSEAR) regulations are said to be key design elements.

T: 01200 422525

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SYSPAL

Easy mixing for small batches

The Eurobin Tumbler gently rotates a 200 litre Eurobin to mix ingredients for products such as coleslaw, salads, pasta, sauces, sandwich fillings, ready meals, vegetables, dried fruit and nuts.

There are no paddles or blades. This, says Syspal, significantly reduces the chance of product damage when mixing delicate ingredients such as pasta, while using one bin for the entire process eliminates product transfers and wastage.

Washdown can also be completed in minutes and the machine is now equipped with a vacuum seal which enables wet mixes and marinades to be handled.

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READY MEALS REPORT

THE PHENOMENAL GROWTH IN READY MEALS DURING THE 1990S AND EARLY YEARS OF THIS CENTURY WOULD BE A DIFFICULT ACT TO MAINTAIN. THE MARKET ALMOST DOUBLED IN SIZE BETWEEN 1999 AND 2004, ACCORDING TO MINTEL INTERNATIONAL, TO REACH A SIZE OF AROUND £1.58 BILLION. MID-1990S ANNUAL GROWTH RATES OF UP TO 20 PER CENT HAVE NOW ADJUSTED TO MORE REALISTIC LEVELS OF AROUND 10 PER CENT BUT THE MARKET CONTINUES TO THRIVE.

PREPARATION AND COOKING

Autoclaving steps in to give longer shelf life

As retailers seek to maximise shelf-life, while maintaining the appeal of 'fresh' meals in the chill cabinet, suppliers have been looking harder at short in-pack thermal processes such as autoclaving. According to Holmach managing director Chris Holland, this can give products a shelf-life of 21 days plus, allowing them to stay on the supermarket shelves for an all-important two weekends.

In the past 18 months Holmach has supplied over 30 Lagarde autoclaves for this type of application. Now, says Mr Holland, the company's customers supply two of the largest UK retailers and three smaller or budget chains.

This change has happened only in the last few years, according to Chris Holland. "If you go back eight or nine years, this equipment was going mostly to manufacturers supplying overseas retailers," he recalls. "Retailers in the UK have tended to be quite resistant. The perception was that this was a canning process, and not suitable for 'fresh' foods."

But now, processors such as Riverside Foods (part of Northern Foods), Geest, Pro-Pak Foods and S&A Foods have installed systems for cooking either tray-packed meals such as Lasagne, Chicken Tikka Masala and lamb shanks, or components such as rice, couscous, vegetables and proteins.

In this type of equipment, the optimum cooking time for the majority of products is said to be just 10 minutes at 90deg C. In some cases, explains Holmach, fully-automated systems have been installed, allowing line speeds of over 120 trays a minute. This includes a cooling

cycle, taking the temperature down to below 5deg C, and so avoiding blast-chilling. Capacity varies between just 100kg and 4 tonnes a batch while full process control and traceability is provided by an on-board PC panel.

Typically, cpet trays with an appropriate heat-resistant top film are used. While this can add 20 per cent to the cost of the top film, for example, the overall on-cost for a sealed plastics tray capable of withstanding the heat process is small when weighed against the benefits, Mr Holland argues. The stand-up pouch is another pack format which lends itself to this type of process.

Holmach also supplies tunnels for continuous cooking, suitable for products such as vacuum-

when you have a significant vegetable component in the pack. For vegetables, breathable films are a better option."

For cooking the components of a meal, especially pasta, D2 Food Systems supplies the Vortex 2 system. According to the company, the cooker has the advantage of offering high daily output on a range of foods while occupying a small floor area.

In January of this year alone, says D2, two Vortex 2 systems were sold to ready meals manufacturers. "What is driving this is the fact that it is the only system that will guarantee no clumping on pasta," says managing director Dave Edwards. "At the same time, it is extremely hygienic."

As well as pasta, says Mr Edwards, the same Vortex 2 cooking system will produce good results with rice, potatoes and vegetables. The 'quench' stage in the cook-quench-chill sequence uses water to take the temperature of the product down from 95 to 20deg C, he explains, but also pulls out a lot of unwanted starch. The 'chill' stage then takes the final product temperature down to less than 5deg C. In addition, the Vortex 2 offers fast changeover

between one product and the next, says D2.

For blending rather than heat processing, Syspal has the Euro-bin Tumbler, which uses a 200-litre bin to mix ingredients. The machine now has a vacuum seal, so that even wet mixes can be handled.

Since it uses no paddles or blades, the Tumbler is said to reduce significantly the possibility of product damage when handling delicate ingredients such as pasta. Even the most



Autoclaving: Pro-Pak Foods is using three new Lagarde autoclaves from Holmach for ready meals production

packed meals. But when it comes to the other major alternative to autoclaving, modified atmosphere (MAP), Chris Holland claims that the technology is a relatively inefficient way of extending shelf-life in ready meals.

As he puts it: "If the product is a component meal, MAP isn't likely to work very well, since the atmosphere is progressively destroyed by the natural deterioration of the different products. And MAP doesn't add very much to shelf life

complex mix only requires two minutes in the Tumbler, according to Syspal.

It is ideal for short production runs, adds the company, and will often avoid the need for transfer from one container to another. As well as time, product wastage can also be reduced this way, and washdown completed in minutes.

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DEPOSITING AND FILLING

Turnkey lines maintain short run capabilities

Ready meals has become one of those established, well-defined sectors where specialist machinery companies can position themselves as project managers and turnkey suppliers.

While those supplying downstream packaging equipment may compete for this role, filling and depositing equipment manufacturer Turbo Systems says it is increasingly being asked to co-ordinate much wider installations.

"We are the product specialist, and depositing is where the customer is either going to make money or lose it," explains managing director Andy Lang. "We are finding that manufacturers are asking us to take control right through the process."

In the past, a customer might source a depositor from Turbo Systems, and a mixer and tray-sealer from two other suppliers, says Mr Lang. "Now they're getting it all through us, so we're ultimately responsible for each part of the process."

Many process and packaging lines for food and drink leapt towards much higher output requirements in the 1990s. But according to Mr Lang, ready meals maintained a requirement for short-run capabilities, despite a steep rise in consumer demand.

Line flexibility is doubly important because of the typically short product lifecycle. "You can see a nine-to-twelve month 'shelf-life' on any one

product," he says. Brands, retailers and consumers are always looking for new recipes and new presentations.

While changeover on the depositing itself is relatively simple, involving straightforward nozzle changes, tray variations can pose more of a challenge, according to Turbo Systems. "We use stainless steel or nylon pallets, which carry the tray or container along the line," says Mr Lang. "We design our own pallets so that each can carry one of two or three different types of tray. This can help limit downtime for product changeover."

In any case, says Turbo Systems, a busy ready meals operation is going to need several sets of pallets, each of 80 to 100 units. Each set, plus new tooling, can cost up to £10,000 and so it is hardly surprising that food manufacturers and their suppliers try to maximise the versatility of these carrier systems.

Ultimately, demonstrating the versatility of a line can make the difference between winning a contract and losing it. Mr Lang explains that one customer has just been shown how the flexibility of a projected line will allow two additional products to run. This now means the company can operate for 18 hours a day, so the project is much more likely to be approved.

Speed and effectiveness of cleardown are equally important when changeovers play such a vital role on the line. Turbo Systems describes three types of ready meals operation: a standard filling unit, an easy-clean depositor, and a full clean-in-place (CIP) system.

According to Mr Lang, many companies believe they need CIP. But this can take 40 minutes for a full cycle which, if carried out at each changeover, would dramatically cut uptime.

"In fact, what people want is a quick flush between products," he says. "We are working on the easy-clean type of system. This takes literally minutes to rinse out all sensitive areas, including the pallets. Then at the end of the shift, you can strip the line down for full cleaning."

As Mr Lang says, one of the company's areas of expertise is in minimising wastage of high-cost product. "CIP systems tend to involve a lot more pipework, and all the product in that pipework is wasted when the cleaning cycle starts up," he argues. "Some companies have tried going down the CIP route in the past and then backed off because of wastage."

For a protein-based meal, Mr Lang points out, throwing away 5 or 10 per cent of product during cleaning can make a huge difference to the profitability of the business.

Efficiency and flexibility are not the only concerns driving investment in ready meals. Companies also have to keep a careful watch on health and safety issues, as many operations move from purely manual processes to semi-automated and automated alternatives.

Ready meals supplier RHM Frozen Foods is hardly a small player in the industry. But transfer of product from holding containers to depositor hoppers has up to recently been a manual operation at the company's Doncaster site, with the containers sometimes being lifted up steps to the hopper.

Now, Turbo Systems has provided RHM with VP100 transfer pumps which were developed from an existing depositor range for pumping liquids. "The system is easy to use, and has taken away the need for manual handling," says Ian Bewick, engineering manager at RHM's Doncaster site.

Weighing the options

At the depositing and filling stage, manufacturers are most likely to consider automation when planning to increase line speeds.

For example, weighing and handling specialist Euroweigh explains how ready meals company FoodPro Manufacturing wanted to increase output by at least 50 per cent but needed to find a way round the manual weighing used for the roast potatoes included in its products.

Any automation would be subject to space constraints and, points out Euroweigh, to the problems associated with fine weight-control of

Topping the pizza

Pizzas remain one of the high-growth sub-categories within ready meals. As producers have diversified their ranges with more adventurous toppings, pre-processed rather than fresh ingredients have become more important.

For example, Turbo Systems has helped Anaka Foods of Bradford to manage volume growth of up to 200 per cent a year in its operation making frozen pizzas with Indian-style toppings. Now Anaka makes 25,000 pizzas a week, incorporating recipes such as Chicken Tikka Masala, spicy kebab and spicy vegetables. Up to seven different varieties of 9in diameter pizza are produced.

Anaka uses an indexing conveyor and D150 depositor. The cantilever-designed conveyor has a quick-release mechanism for fast removal and cleaning and the air manifold pipework



Multi-head filling: Handling sauce with a Turbo Systems depositor

large-piece vegetables, especially at higher line speeds. Missed loads could mean lost end product, and a pattern of overweight portions would hit the customer's bottom line.

But FoodPro decided that Euroweigh's compact Speedweigh 311 linear weigher met its space, speed, accuracy and price requirements, and has ordered a four-head system.

Says FoodPro general manager Matt Brindley: "The product weighing procedure is highly efficient, and with the overall savings in production and manpower, we anticipate it will be self-financed within 12 months." Euroweigh is confident that the 311 can not only accommodate

the 50 per cent increase in output, but potentially sustain even higher line speeds.

The 311 operates at speeds of 60-80 weighings a minute, depending on product. This can include fruit or vegetable pieces, and most wet, dry or frozen solid pieces up to 30mm across, in a weight range of 10-500g. As well as roast potatoes, the FoodPro system is also suitable for free-flowing vegetables such as baby carrots, peas and sweet corn, says Euroweigh.

Each of the 311's four heads has an independent front and rear vibratory feed tray. Product is loaded via a gravity feed hopper mounted above the rear tray. As product feeds forward, a



Placing pizza topping: Turbo systems has supplied Anaka Foods with this D150 depositor

allows quick and simple connections to the air supply.

The D150 doses grated cheese or sauce accurately and consistently in pre-programmed volumes. It can handle liquids, semi-solids and par-

ticulates, and can be tailored for particular products. It uses lubricant-free pneumatics or electro-pneumatics.

Oiling of pans, platens and product is another aspect of pizza production which lends itself to automation. Saturn Spraying Systems has supplied names such as Ross Youngs, Green Isle, Kiren, McCains and Express Products.

Applications include precision oiling of pizza platens, spraying dough balls with oil, spraying a release agent into pizza pans and spraying oil onto cut pizza bases. There has even been an installation spraying an inch-wide ring of garlic-flavoured olive oil around the rim of a rising-crust pizza base, says Saturn.

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READY MEALS REPORT

level sensor controls the contents of the front tray. The contents of the weighpan are then policed by a set of bulk and fine shut-off gates.

The F1 microprocessor control can operate with either average or minimum-weight settings. As well as target weights, this control system monitors functions such as vibration levels, bulk and fine gate closing.

Meanwhile, Easiweigh has installed one of its Quartet linear weighers to handle fresh and frozen vegetables for a food manufacturer seeking to reduce the number of operators on a ready meal line, while maintaining line speeds of up to 54 trays a minute.

Four trays at a time

The Quartet weigher allows four trays to be filled at a time from as many weigh heads while the Pulse control unit maintains product weight parameters and is said to have cut giveaway in comparison with the previous manual loss-in-weight system.

Product appearance was another problem when the trays were manually filled, according to Easiweigh, but the Quartet's rise-and-fall unit on the outlet chute has led to improvements here, too. A tray-in-position sensor ensures that if no tray is available, no product is deposited.

The customer expects to see payback on the new line within a year.

Installations of Ishida's Retail Ready Line (RRL) since its launch at Interpack last year have included manufacturer Frenzel, now said to be the third largest producer in the German frozen food market. As also with many chilled ready meal lines, the emphasis is not on high output. The value-added product, in trays which allow steam-cooking in the microwave, are filled and sealed at speeds of around 45 a minute, says Ishida, although future increases in output would be possible.

Frenzel's RRL spans tray denesting, weighing, filling, checkweighing, tray sealing, metal detection, board sleeving and case-packing. It produces six different varieties of meat and vegetable-based frozen ready meals and format changeovers take under 10 minutes, says Ishida.

Product combinations are currently filled into 300g and 450g trays, although the line's inherent flexibility means that new tray formats and product types can be accommodated.

Operating at -8deg C, the filling station starts with elevators conveying four different types of product to a 24-head multihead weigher. The closest target weight from the various hoppers is discharged into each tray. A second 10-head



Feeding two lines: Adams Pork Products is using an 18-head Bilwinco combination weigher

multihead adds sauces consisting of small balls of butter, bringing the total number of food components to five.

Fresh sauces can be added via separate dispensers and checkweighing takes place before the trays are sealed, so that over and under-weight meals can be detected without wasting packaging materials.

Adams Pork Products (Geo Adams) is now also using a multihead weigher and has an 18-head Bilwinco BW118W machine, supplied by UK agent Ancholme Machinery, working on two adjacent lines loading meat-coated egg products into trays. The weigher is programmed to function as two independent nine-head systems to serve the two lines.

Product reaches the vibratory feeder to the multihead either from an overhead infeed or from an elevating flighted-belt conveyor suitable for loading from tote bins at ground level. Bilwinco also supplied the orientation tooling and tray indexing conveyors on the filling line.

US manufacturer Multi-Fill, represented in the UK by F Jahn and Co, has developed a product distribution system that allows its MPF SC120-01 automatic solids depositor to work with multi-lane machines, such as thermoformers or tray filling/sealing lines.

The system, aimed particularly at ready meals, is designed to handle hard to fill products such as cooked rice and pasta, vegetables, fruits and refrigerated salads at speeds up to 120 containers a minute. One MPF filling head can now deal with up to eight containers in various combinations or patterns. Alternatively, the distribution system can be used as a stand-alone unit working, for example, directly under a weigher.

Meanwhile, Grunwald UK reports that a

major UK supplier of chilled ready meals has installed a second line, after first installing one in 2004. The system this time uses a Multipond weigher for proteins, alongside various depositors and a Grunwald Flexodos volumetric filler for pasta products. The two-lane operation fills hinged-lid trays at speeds of 50 a minute.

Grunwald says its Flexliner line uses motorised adjustment for product changes, with only the pack magazine and pressing plates requiring change parts.

To complement its existing range of depositing machines for ready meals, Riggs Autopack has made further improvements to its Makeup Conveyor. The open, hygienic construction, using a single chain and pusher-pad container drive, now allows washdown with low-pressure hoses.

The conveyor incorporates stainless steel compressed air pipework with take-off points for individual depositor stations and signalling as required. They can also include electrical power sockets at regular intervals.

In addition, Riggs has developed a compact mobile transfer pump to transfer product from Euro-bins or tote-bins to the depositing machine hopper. The pumps are said to be suitable for both low and high-level hoppers and for hot or cold products, with or without particulates.

High-volume, high-speed

While chilled ready meal lines are a key growth area within this sector, often requiring low-to-medium volumes and good flexibility, frozen ready meals remain an important sub-sector in their own right. As Raque Food Systems explains, output and run-lengths can be significantly higher for frozen ready meals, since longer shelf-life allows for greater flexibility in storage and distribution.

Raque has historically specialised in these high-volume lines, many of them for frozen ready meals. But as thermal process specialist Holmach points out, autoclaving has allowed manufacturers to explore other methods of

extending shelf-life. According to Raque, a combination of autoclaving and high-integrity sealing inside a high-barrier tray-and-lid combination can give ambient ready meals a shelf-life of three years.

Recently Raque installed a 240-tray-a-minute line, said to be the fastest of its type in the world, for a US supplier to the military. The same customer already has a 120-a-minute line.

The use of a continuous-motion system is essential in achieving this high line speed, explains Raque Food Systems Sales managing director John Rose. Dispensing comes courtesy of two 24-head Multipond multi-head weighers for proteins, rotary cup fillers for vegetables and several eight-head volumetric piston fillers for sauces. All of these transfers are carried out on the move, with the travelling carriages accurately tracking the trays as they are filled.

This US installation uses twin lanes. "To achieve the same output on an intermittent-motion line you would need six or eight lanes," says John Rose, "which would be very complex."

The continuous-motion tracking technique is also vital in ensuring that the filling is splash and drip-free. "Cleanliness of fill is of paramount importance," says Mr Rose. "You only need a pinhead of sauce in the filling area for the whole tray to blow apart in the autoclave."

Denesting control

Container denesting is one of those areas of technology where filling or packaging machinery companies offering turnkey installations often tend to defer to the specialists. If the line cannot be fed with a consistent and reliable flow of trays, then the quality of depositing and sealing is irrelevant.

One such specialist is FP Packaging Machinery which has recently upgraded its range of systems with servo controls, to offer speeds in the range of 60-80 cycles a minute per lane.

The first of two recent installations which demonstrate this new capability is at a ready meal supplier to the health sector. Here, two servo-driven twin-lane reciprocating foil tray placers manage speeds up to 54 trays a minute. The adjustable magazine will take tray lengths of 175-320mm while tool-free size change takes "just a few minutes", according to FP.

A second ready meal producer has taken a twin-head servo-driven system to feed a queuing conveyor fitted with a timing mechanism. In this case, denesting takes place at a rate of 60 cycles a minute and there is a handwheel-based size change that allows eleven tray sizes to be used.



Multi-lane filling: Multi-Fill MPFSC120-01 automatic solids depositor from F Jahn and Co

TRAY SEALING

Focus rests on hygiene, access and cleanability

When it comes to tray-sealing, the focus is now on hygiene, cleanability and accessibility, says ready meals specialist D2 Food Systems.

D2 has been working with Spanish supplier Ulma to update and expand its range of Scorpius tray-sealers. Having previously represented Mondini, which has since established its own UK business, D2 is now the exclusive distributor of Ulma tray-sealers for Britain and Ireland and is launching a new range of four machines this March.

Completely new will be the lower output 400 and 600 machines. The 850 and 1100 tray-sealers were originally introduced around 18 months ago, but have since been redesigned, explains D2 managing director Dave Edwards.

"The demands of the UK ready meals market are far higher than they are overseas," says Mr Edwards. "It's a very competitive sector. There are far more chilled meals here than elsewhere, which means that fast-changeover, ease-of-access and hygiene are all more critical." Customers are also looking for scaled-down machines which achieve similar or higher output inside a smaller footprint, he adds.

Most tray sealers, at least in the higher speed ranges, use a system of pneumatically-locked dies for product changeover, explains Dave Edwards. Once the lock is disengaged, these simply slide out on to a trolley, and a second die is substituted. Film length and vacuum/gas levels are menu-driven from a PLC. On the Scorpius range, this means that a complete size change can be set up in 10 minutes or less.

Changeover time is important, says Mr Edwards, because a medium-to-large-sized producer might be packing between 500,000 to 600,000 meals a week, spanning 70 or 80 different meal types in 20 different trays. In this case, he extrapolates, the company may need to change the sealing line three, four or even five times a day. For high-value products, typical runs may last for just half an hour or so.

"But the real focus for us at the moment," says Dave Edwards, "is on cleanability and accessibility." Easy access is essential not only for effective cleaning, but also for maintenance. "All areas of the machine are easy to

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Tray sealing: (top) TS250 machine from AEW Delford for low-to-medium speed production. (Above) High speed twin lane Raque tray sealer. (Left) Proseal AP60 machine will handle up to 160 trays a minute

Pivoting sealing heads make size change simple and convenient, says Raque, with the sealing platens requiring no pre-heating, and so saving on downtime. The cantilevered die-cutting head allows knives to be slid in and out, and the quick-release tray-carriers mean fast, tool-free product changes. The rate of lidding material consumption at high speeds makes the use of a second stand-by film mandrel invaluable, says the company.

Like other sealing equipment specialists, Raque has just three parameters to play with: time, temperature and pressure. "So, with our lines running at such high speeds, we generate much higher sealing pressures than anyone else

on the market," says Mr Rose. "And if you're exerting this huge downwards pressure, you need to provide an equal and opposite force, so the machines are extremely robust."

Raque points out that, unlike many other suppliers of sealing equipment, it

separates out the sealing and profile-cutting as two distinct stages, so simplifying the operation.

Supplying smaller lines

At the low-to-medium speed end of the market, AEW Delford Systems has been marketing the TS250 tray-sealer for around a year now. According to sales director Dave Evans, the company has no plans to expand this range to include more than this one machine, which is equipped for modified atmosphere packaging. One-up, two-up and four-up versions are available.

When applying MAP, the TS250 is capable of running at speeds up to 15 cycles a minute and in a four-up configuration to give output of 60 packs a minute. Speeds are faster for non-MAP requirements. But as Mr Evans maintains, while high-speed lines are available from other suppliers, most lines for prepared foods such as ready meals do not require that type of output.

An integrated lane divider allows trays to be automatically loaded from a feed conveyor into the sealing carousel. Change parts can be swapped quickly and without the use of hand tools, says AEW Delford, while a touch screen gives simple operator access to settings. Changeover on the die set and tray tooling is said to take between 10 and 15 minutes.

Pin-centering ensures that each tray is positioned accurately for optimum film cut and sealing. The MAP chamber operating system offers

get to. There are no trap points or dead areas."

Mr Edwards continues: "Lines will often be handling very wet products. So at the end of a shift, you want to be able to use high-volume, low-pressure water to clean the machine down, with no possibility of the water puddling."

D2 claims that the indexing system on the Scorpius range is such that trays containing sauces or other liquids can be moved without spillage.

Tray-sealing speeds have been increasing, to the extent that the largest Ulma machine will seal up to 150 trays a minute, according to D2. Starting speeds in the Scorpius range are around 20 a minute. "As you progress to sealing multiple trays in each cycle, features such as high sealing pressures become very important," Dave Edwards points out. "Because of its long experience of thermoforming, Ulma has a very good mechanical lift mechanism."

One of the first Scorpius machines supplied through D2 has gone to CP Foods' new factory in Newmarket. The machine is being used to seal trays of frozen and chilled ready meals.

Says technical director at CP Foods Ian Hunt: "The machine's compact size is a major USP, as we have limited line space, and the hygienic stainless steel design with IP65 cleaning programme is particularly important for food production environments."

Some suppliers are paying particular attention to reducing materials wastage at the sealing stage. John Rose, managing director at Raque Food Systems Sales says: "We've come up with a process which can save between 30 and 60 per cent on lidding materials using our systems." Mr Rose will not go into specifics at this stage, but says the technique will be equally applicable to high-volume tray-sealing lines and smaller output installations.

Most of Raque's existing tray-sealing systems complement the high-volume frozen ready meal filling lines for which it is best-known. A multiple-component dispensing line recently installed at a supplier to the military in the US is matched with a platen heat-seal machine. In this case, the line is for extended shelf-life ambient meals, with speeds of up to 240 a minute.



Easy access: Waldner Interseal tray sealer now available from Selo-Bollans

similar precision, according to the company, with gas usage minimised for each pack.

According to Mr Evans, AEW Delford's move into tray-sealing came as a response to the market's migration to top-sealing, and the corresponding decline in loose film overwrapping of trays. Like so many retailer-driven trends in UK food and drink packaging, this change has been almost complete. And while the supplier's primary aim was to keep up

with developments in fresh meat and poultry, the same system can be used for composite ready meals. In both of these cases, gas flushing can be tailored to optimise shelf life and product appearance.

Pack and seal quality

Rather than speed, AEW Delford emphasises the importance of pack and seal quality. "If you're going to get the stated shelf-life, the gas needs to stay in there," says Mr Evans. "So the security of the pack seal is of vital importance. Our leakers rate is correspondingly very low."

Coping with similar line speeds to the AEW Delford machine, an F45 machine from heat-seal specialist Proseal has been installed at Geo Adams' factory in Spalding. The producer of savoury eggs, including Scotch eggs, supplies all



Entry level: Packaging Automation PA182 sealer at Bighams

the major retailers and needed an off-line packing facility for last-minute orders.

Proseal also launched a higher-output linear tray-sealer in the second half of 2005. The AP60 is designed to run in-line with filling and other line equipment at speeds up to 160 packs a minute. 'Free-flow' gas flushing can be used to extend shelf-life.

Abergavenny Fine Foods is packing its breaded cheese products using Ishida's QX775 tray sealer. Running at speeds of up to 50 trays a minute, the line handles products such as Breaded Camembert, Breaded Mozzarella Fingers and Salmon and Cream Cheese Bakes. The company needed to increase capacity, while having limited space available in the factory for new equipment.

There was an additional requirement for a

vacuum and gas-flush system, which came in the shape of Ishida's MAP-V process. Residual oxygen levels have to be very low, says process development manager Richard Bowman, adding that this system performs well by creating a vacuum and then quickly and accurately injecting nitrogen.

Abergavenny also valued the ability to control the speed of the infeed conveyor. The cheese products are manually loaded into the trays, and hand-packing speeds can vary considerably between products – or even between packing teams.

Changeover in 10 minutes

Tooling on both the Ishida tray-denester and tray-sealer can be changed in just 10 minutes. "With some tray-sealers the changeover can be as much as 45 minutes," says Mr Bowman, "and this is totally unacceptable."

Servo drives on the QX775 ensure that film speed, tension and cut-off lengths are consistent. Ishida says that its 'Inside Cut' technology stops lidding film from extending beyond the tray edge and also reduces film consumption by 5 per cent.

Other recent tray-sealing installations in the UK include a Vision 182 in-line machine from Packaging Automation, chosen by Riverside Bakery which supplies a range of stew and casserole ready meals in cpet trays to a major retailer. Among the heat-seal tooling options supplied by Packaging Automation is one set which provides an in-board trim for circular pots with 'ears' or handles. Since the film is cut before sealing in a separate process, says the company, there is no risk of damaging these projections.

For entry-level, rotary sealing, Packaging Automation says it continues to supply Bighams Global Gastronomy in London with its PA182 twin-station machines. These semi-automatic systems allow changeover in just two minutes, says the company.

Selo-Bollans is now representing German Waldner Group's Interseal range of tray-sealers which, it says, offer extremely fast, tool-free changeovers. The tooling trolley has its own pre-heating system, avoiding the need for a warm-up time on the machine after a size change while easy access to the tooling area and other parts of the sealer is key to the design, says Selo-Bollans. The line is compatible with RF sealing as well as vacuum and MAP systems.

A range of semi-automatic and fully-automatic tray-sealers from Vacuum Pump of Italy is being sold through Erapa (UK). The GV80 and GV90 machines will run, with two sets of tooling working in parallel, at up to eight cycles

a minute with vacuum/gas and 12 a minute without. PLC-controlled, the machines are built to IP65 standards and feature a soft-start/soft-stop facility to avoid spilling sauces or liquids. A pneumatic tray denester can also be supplied with the GV80.

In a new patented process, Erapa says the same machine range will seal hinged lidded trays with vacuum and MAP, and without the use of a top film.

Finally, Planet Flowline has supplied Heinz Frozen and Chilled Food at Okehampton, Devon, with a high speed twin lane Tecnovac Cronos tray sealing machine to handle a range of frozen desserts in 95mm diameter round trays. These are fed randomly from a spiral freezer in a single lane and then split into two lanes by a diverter belt before being spaced and entering the sealing machine as a 6 x 2 collation.

Other recent Tecnovac installations include an Athena machine for sealing round trays of sauce, which are subsequently sterilised in a retort, and a number of Ermetica M3 hand sealing units for products as diverse as jam into buckets and fresh prawns into trays.

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DECORATION

First steps in automation for board sleeving

Like many other secondary packing and end-of-line operations in ready meals, say machinery suppliers, board sleeve application has often been left as a manual task, although automation is now being taken considerably more seriously

For example, AEW Delford's CT60 sleever is designed as an entry-level system for those moving out of hand-sleeving. The machine can be employed in-line with the company's tray-sealer, running at a similar top speed of around 60 packs a minute and is also readily relocatable for use in different parts of a plant.

The company points out that the flat blanks used in this type of wraparound system are cheaper than the pre-glued alternative and also make a tighter sleeve possible.

Complex die-cut sleeves can be handled as well as those for round containers while sleeves can vary from full-width to 'watch-strap', where the quantity of board and size of the product information panel are minimised. The magazine hopper contains up to 600 sleeves.

According to AEW Delford sales director Dave Evans, the widespread introduction of the company's C-labeller for sealed trays was "one of the biggest changes that happened last year". The labels, which include panels on the top, side and base of the tray, are now widely used for catch-weight items such as fresh meat and poultry, but are also suitable for ready meals, he says.

The C-labeller has a number of potential

advantages, says AEW Delford, including significant material savings compared with board sleeves.

Application speeds can be up to 80 a minute, says Mr Evans – again comparing favourably with the CT60 wraparound sleever. And the reduced information and branding area on the top of the pack can be turned to the retailer's advantage, he adds, as shelf space is increasingly optimised through vertical stacking, with key product information on the side panel of the label.

Another company offering a label-based alternative to sleeving is Erapa. The automatic BandAll system applies polypropylene or wet-strength paper labels in standard widths of 29, 48, 75 and 100mm. On-board printers can provide variable information coding.

Entering the market

Like AEW Delford, D2 is targeting those entering the market from hand-sleeving. "As line speeds and labour costs have increased, so too has demand for automatic sleeving," explains managing director Dave Edwards. But this company claims that, in most cases, the move is to automatically-applied pregglued sleeves, since the most wraparound machines take up more space and are relatively expensive. In the case of D2, a short machine from Rama in Italy can efficiently replace two operators doing hand-sleeving, Mr Edwards argues.

For its part, Jacob White (Packaging) says it has a patented system on its latest board sleeving machine for holding the sleeve in position while the tray is inserted. Its semi-automatic SLX3 machine also features PLC control and digital indicators to assist size change.

But if entry-level replacements for manual sleeving represent a major opportunity for



Higher speeds: Cama OTT wraparound board sleeving machine can handle 100 trays a minute

machine suppliers, so too do higher-output lines. French machine manufacturer Paker, represented in the UK by Integrapak, has sleeving machines in output ranges from just 40 a minute up to 300. Fed with unglued blanks, these machines offer fast changeover – five minutes manually or just three minutes automatically.

Fitting into the medium-high output range, Cama of Italy has installed its OTT sleeving machine at a leading UK producer of ready meals. Again, using the wraparound principle, the system is capable of achieving speeds of 100 rectangular or round trays a minute. A ‘tuck-in lock’ ensures the sleeve does not slip off again once applied, says UK company Cama 3.

T Freemantle has preglued and wraparound sleeving options for ready meals applications. Its preglued sleeve is available in a semi-automatic version capable of handling 80 trays a minute, and an automatic version with an output up to 120 trays a minute. Over the last three years, says sales and marketing manager Richard Kitchen, the company has installed over 45 of these machines at customers including Northern Foods, Unilever and Young’s Bluecrest.

The same machine can run full sleeves, watchstraps, bands and twin-pack sleeves, says Freemantle, with in-line date/batch coding and size changeover time of around six minutes. The tooling set is designed to cope with intricate sleeve designs such as Unilever’s recently-launched steam-fresh product in a twin-pack.

When it comes to wraparound sleeving, Freemantle has supplied three of its updated machines to Northern Foods, applying watchstrap sleeves to round trays. The machine now includes a pack-squaring mechanism for consistent quality in pack appearance and gives speeds of over 100 trays a minute.

Kliklok-Woodman confirms the popularity of higher-speed sleeving for this sector. Eight of its



Banding alternative: *ATS machines use ultrasonic sealing*

Certiwrap C150 wraparound sleeving lines were ordered by ready meals customers in the second half of 2005, says the company. The 150-a-minute machine offers three-dimensional size change in just 10 minutes, and features a patented rotary feeder. Round and rectangular containers can be sleeved on the same machine.

A slower version, the C80, capable of sleeving 80 trays a minute, is also available and incorporates many of the features of the C150.

Interest in cartoning

Despite the growth in board sleeving for ready meals, Kliklok-Woodman reports continued interest in traditional cartoning within the industry. Its mid-range SFR stainless steel machine achieves speeds up to 150cpm and has been installed on a frozen ready meal line at the Findus Longbenton plant.

The Findus end-load cartoner accepts Meat & Potato Pie trays in 500g and 900g sizes, in this case at a rate of 120cpm. Gapping and timing on the infeed, which takes filled trays arriving at a random frequency, is of vital importance, says

Kliklok-Woodman. A high-speed version, the HSR, is also available, this time with speed capabilities of up to 300 packs a minute.

Another supplier of the Certiwrap range in the UK is Field Packaging Systems. According to project team manager Jeff Jones, the Kliklok range is particularly recommended where line flexibility is required.

But Field also supplies three types of wrap-around sleeves from Spanish company Pack Service. These are the low-speed semi-automatic Mini PS giving an output of just 20 trays a minute, the mid-range PS60 with speeds of 60 packs a minute using a reciprocating feeder, and the PS 120 which manages twice this output using a rotary feed. Field Packaging also manufactures tailored infeeds for the Pack Service range.

Banding is an alternative to sleeving that is popular on the Continent and is being pushed quite strongly in the UK. According to Swiss banding machine supplier ATS, represented in Britain by Jenton International, banding offers considerable cost savings as well as being harder to tamper with.

“Sleeves are woefully expensive in material and manpower,” claims Erich Lohner, general manager, sales and marketing, at ATS. “And because they are a relatively loose fit, it’s easy for unscrupulous shoppers to swap a cheap product for an expensive one.”

For volume producers, he adds, banding requires fewer operators per machine. “Banding machines are standalone or fully-automated devices that are simple to operate, whereas sleeve erecting machines are far more complex and cost many thousands of pounds more. The tighter fit of a band also stifles any intent to deceive by would-be miscreants in stores.”

Mr Lohner says ATS normally estimates the payback time on a banding machine to be “a

matter of months" and points out that banding material is "considerably less expensive" than sleeving.

"Ultrasonics can work continuously in the cold, humid conditions typical of a food factory, producing odourless seals that do not burn the banding film, leave deposits, or damage or taint the product," points out Mr Lohner. "In comparison, sleeves require gluing, which is an added production headache."

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END-OF-LINE

Compact machines aimed at smaller packing areas

There is no shortage of end-of-line equipment suppliers providing customers in the ready meals industry with the type of machinery that would be equally at home in any other type of food environment. But according to Dave Edwards, managing director at D2 Food Systems, compact size is becoming increasingly important in the final stages of the packaging process.

"The factories in this sector tend to have been recently built, with very small packing areas outside the sensitive production hall," he notes.

In fact, many of these end-of-line areas began life as manual operations with minimal space requirements. But as output has increased, large numbers of these specialist small to medium sized companies have seen the number of operators required increase to three or four over different shifts. Faced with these rising labour costs, many are considering automation.

"We developed a small, robot-based modular system. Historically, the equipment on the market has been very large and fairly expensive," says Mr Edwards.

Plastic crates packed

As well as being more affordable, this new system from Italproject in Italy can include tray-sleeving, case-erecting, packing and palletising all within a 5 x 1.5 metre footprint. Plastic crates can also be packed and palletised on the same basic modules.

However, D2 does offer larger systems for those who need them. These Italproject

machines include the Robypack casepacker, the Eurowrap wraparound casepacker and the Minipal palletiser. It also has a range of pallet stretchwrappers from Technowrapp, a sister company to Italproject.

Like other food and drink products, ready meals are increasingly being demanded by UK retailers in shelf-ready packaging. Norwegian end-of-line specialist Nor-Reg, represented in the UK by Cornwell Products Machinery Sales, recently installed two high-speed tray-packing machines at a leading British manufacturer of chicken-based ready meals, such as Chicken Kiev.

Incoming trays are collated into a display format of between four and eight per outer, and top or end-loaded into the case. The format subsequently allows product to be loaded quickly, and directly, on to the retail shelf.

For flexible ready meal pouches Nor-Reg's method of pouch handling is said to allow the products to be packed into cases that are smaller and less expensive than traditional cases. Again, open cases or two part tray and lid cases are possible with the packs displayed in the cases either flat or standing for maximum on-shelf impact. ■

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Speed and flexibility the aim in Machines to count on

SUPPLIERS OF COUNTING MACHINES, PARTICULARLY FOR PHARMACEUTICALS AND CONFECTIONERY, ARE SEEKING TO BALANCE THE OFTEN CONFLICTING DEMANDS OF FLEXIBILITY AND SPEED.

Historically, manufacturers of pharmaceutical products such as solid dose tablets, capsules and gel caps, have faced two choices when buying counting equipment – slat counters or vibratory counters.

For large volumes and high speeds, the slat counter was generally considered the best bet. These use slats with channels shaped specifically to accommodate each tablet size on the run, and operate at speeds of to 40,000 tablets a minute. But such high speeds come at the expense of flexibility; for every new product that is introduced, a different set of slats is required, which can make a slat system a costly option.

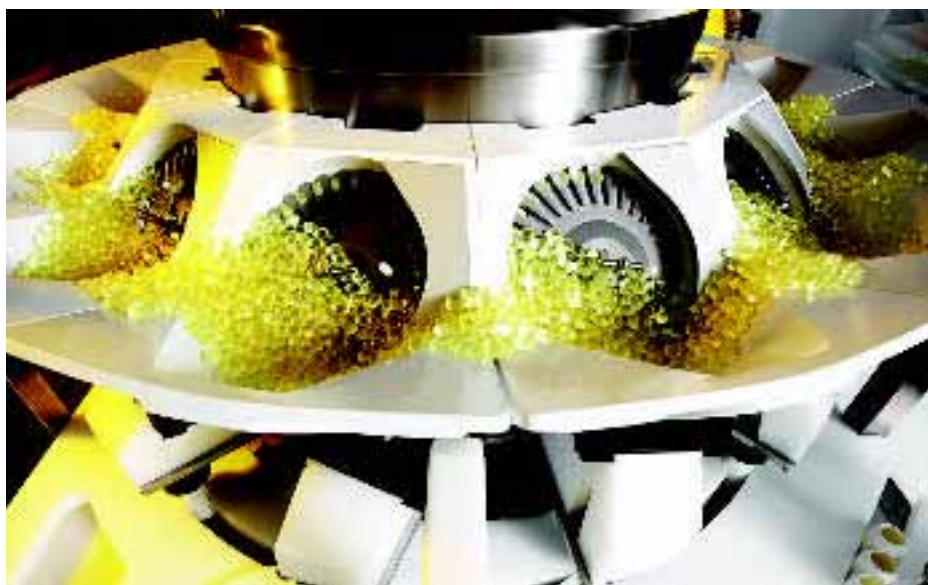
Those manufacturers looking for flexibility over speed would usually have opted for counting machines with vibratory feeders, which separate products by vibration and channel them in single file past an electronic scanner. These systems operate at much lower speeds of, say, 5000 tablets a minute, but require few or no change parts.

However, most pharmaceutical manufacturers today don't want to have to choose between flexibility and speed – they want both. Equipment suppliers have responded with machines that deliver on both counts.

For example, Brunel Healthcare, a UK-based manufacturer specialising in OTC licensed medicines and vitamin and mineral supplements, historically used traditional vibratory tablet counters. However, as demand for its products increased, it became apparent that simply installing an additional vibratory counting line was not an option.

Following discussions with QBL – its partner company for packaging services – and Romaco UK, Brunel bought a Bosspak RTC 200 tablet and capsule counting line.

Supplied by Romaco UK and installed at QBL's Burnley premises, the line includes unscrambling, counting, capping, re-torquing and labelling systems. The line has been installed 'through the wall', with both bottling and cap-



Counting via disks: A Bosspak Rotary RTC 200 machine is now used for Brunel Healthcare products

ping completed in a class 100,000 cleanroom.

Brunel's managing director, Ron Stagg, says: "Brunel's success and growth are based on the company's responsiveness to market requirements. Demand for our products has increased dramatically, to the point where we needed to increase throughput significantly. It was quickly concluded that Romaco's Bosspak technology was the only viable option, offering unrivalled output potential, together with state-of-the-art quality and security controls."

Speed and flexibility

It is claimed that the Bosspak Rotary RTC combines speeds previously achieved only by slat counters with the flexibility and control of an electronic system. On difficult shaped products such as caplets and soft gel capsules, the RTC has been shown to exceed significantly the speeds normally associated with vibratory machines.

Tablets or capsules are collected from the hopper by rotating disks with pockets around their rims to carry individual products to the point of delivery. Products are released into the

bottle neck in a single stream and counted by a 'Quad Count' optical sensor matrix, also capable of detecting damaged items. Single stream delivery minimises the risk of clogging. The touchscreen user interface permits entry of parameters such as disk speed, dark time, count setting, gating delay and storage of recipes.

Netherlands-based Cremer, meanwhile, manufactures multi-channel counting machines which use vibratory plates to separate products which then fall freely through the detector channels. Counted products are cascaded down through several 'memory flap' units after which the correct quantity is discharged into a bucket elevator or packaging machine. Cremer says the fast 'memory flaps' enable its counting machines to operate non-stop so that maximum output is guaranteed.

Schwarz Pharma in the USA recently opted for two of Cremer's Double Tablet Counters when it was looking to replace its old counters with systems that could increase productivity while accommodating over 70 different tablets and capsules, ranging from 6 to 18mm in size.

Within a space-saving 12ft footprint, the

COUNTING

Cremer Double Tablet Counter has two counting heads and a two-lane conveyor that fills up to 110 bottles a minute.

"When it was time to replace our old tablet counters, we began looking for new technology that would achieve our high line speeds and produce accurate results," explains James Cognata, project engineer at Schwarz Pharma.

"We are confident that Cremer has the best tablet counters. You can have the dustiest product and these things will not miss a count. Since we installed the Cremer systems, we have been operating with zero per cent defect on count."

As Schwarz is frequently changing between different products and container sizes, flexible filling and quick changeovers are critical. Up to 300 product recipes can be pre-programmed, enabling product-specific machine and control parameters to be downloaded for fast and simple set-up and changeover.

"The Cremer Double is very easy to take apart to clean. With a spare set of product contact parts, we are able to change over the tablet counters in less than 20 minutes," says James Cognata.

New version of counter

For the last two years Cremer has been working on a new version of its CF tablet counter which will be ready for launch in May. The new model works on the same free-fall scanning and counting principles, but promises to deliver a number of new features and benefits.

It is modular in construction and features a new memory flap control system as well as a new container transport system. "It becomes not just a question of how fast the machine can count, but how fast it can handle containers, because if you have 300 containers a minute coming in, you've got to be able to handle them," explains Roger Wayte, sales engineer with Cremer.

He says the machine will be capable of outputs up to 400 containers a minute.

Cremer is not the only supplier to be unveiling a new high speed tablet counter this year; Italian manufacturer IMA UK has just intro-



Twin machine: Cremer CF1220 with two counting heads and a twin lane conveyor



Single tablet rejection: IMA Conta series electronic tablet counter

duced the Conta series of high speed electronic tablet counters, which it says can achieve speeds of 30,000 tablets a minute, which equates to 300 bottles a minute at 100 count.

The Conta series is said to be the only tablet counter on the market to feature single tablet reject – eliminating full bottle rejects and the associated rework. IMA's patent pending camera vision system screens tablets and capsules for shape, colour and integrity.

Indeed, as the technology gap closes between the various systems on the market, ancillary functions are increasingly being pushed as a differentiating factor by counting equipment suppliers. Many counting machines today profess not only to count quickly and accurately, but to also act as a quality control tool, by screening the product flow for broken or damaged items.

IMA Swiftpack, for example, has developed an electrostatic sensing system for its electronic multi-channel counters, which it claims can detect half-filled, broken or double tablets and capsules.

The system, which is incorporated into IMA



Count and checkweigh: Collischan TC8210 checkweigher hosting a Minicount tablet counter

Swiftpack's SV2 Intellisense counter, uses an electrostatic field to provide accurate assessment of tablet parameters such as size, shape and weight. Tablets are measured against the pre-set parameters as they fall through and disturb the field, with any tablets that do not conform rejected automatically.

Range of quality checks

IMA Swiftpack says this inspection technology can offer a range of quality checks compared with infra-red technology, which can only check a product's shape. It can identify empty or partially filled capsules, and while infra-red systems can only recognise half tablets, the SV2 can detect even the slightest tablet imperfection.

However, in stretching the versatility of counters, is there a danger that you end up with a machine that is a 'jack of all trades, but master of none'?

Heavy duty counting

It's not just high speed pharmaceutical and confectionery lines that deploy counting systems. Bulkier items, such as plumbing, heating, hardware and automotive parts, also have to be counted.

At the last PPMA Show Automated Packaging Systems introduced an automatic counting system called the AccuCount 200 which is capable of counting these and other items at speeds up to 2500 packs an hour.

Orientation funnels channel the product down from a bulk to a single flow to give enhanced control of the parts as they fall through the electronic detection eye for counting and batching.

Once the detection eye reaches the desired number of parts, an overcount discharge diverting funnel is activated, which redirects parts into an isolated bin.

The AccuCount 200 also operates a part profiling analysis, which assigns a value to each part. Any part below this value in weight or size, such as dirt, or broken parts, is identified as scrap and discounted.

Automated Packaging Systems says cus-



Counter-bagger: AccuCount 200 mounted on an Autobag bag-on-reel bagging machine

tomers who have replaced a manual operation with an AccuCount 200 have seen a five fold increase in productivity.

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Cremer has made a conscious decision not to go down the inspection route, preferring instead to focus on improving the accuracy and flexibility of its machines, as it questions whether wholly accurate inspection and high speed counting can be carried out simultaneously.

Roger Wayte predicts that future developments will focus on integrating the counting and the weighing functions more closely.

Validation process

"More and more manufacturers want to be able to validate what has been counted. To date the only methods of verifying this are by manually counting product – which is completely impractical – and by weighing the container, which slows the system down as it can only be done statically, not dynamically."

There is evidence that manufacturers of counting equipment are making some headway in this area.

Logic TPS has designed a new tare and gross checkweighing system for use with both new and existing electronic tablet and capsule counters. Called the TC8210, the system will pre-weigh and zero a bottle weight before filling and then check the final weight of the count after filling.

Keith Gooch, managing director of Logic

TPS, describes it as a double-tier system. "Electronic tablet counting was brought in as a flexible solution, but it's not always the most accurate, so we're offering a system which counts and weighs at the same time. It's a double check for the filler in case of a funnel blockage or a malfunction on the machine," he explains.

"Particularly on electronic machines, if an air valve malfunctions, it could give an undercount or an overcount. There's no way of checking this after the tablets have been counted other than an operator checking each individual container."

The bottle is controlled in a star wheel and features a positive accept reject system to ensure that any bottles with undercount are rejected. "This assumes the products are all wrong until it knows it's got the right count and weight," explains Mr Gooch.

Logic TPS distributes a range of electronic counting machines which are designed and built by Collischan in Germany. There are three counters in the range: the single track Minicount, the dual track Minicount Twin and the Multicount 12 track, twin funnel machine. They achieve respective outputs of up to 1500, 3000 and 8000 tablets a minute.

Meanwhile, Hachmang, represented in the UK

COUNTING

by Engelmann & Buckham, is about to deliver a line which includes nine counting systems to a German confectionery customer. The system also includes a bucket elevator with two discharge points, two vertical baggers, two weighing scales and a separate after-dosing system.

By using the counting systems in combination with checkweighing before product is packed, underweights can be detected and rectified rather than be rejected, resulting in less waste and greater efficiency.

First of all, eight counting machines count a mix of products to 99.99 per cent accuracy. The bucket elevator then collects each product in the programmed quantity and transports the mix to one of two discharge points above the vertical baggers. Beneath the exit of each discharge point is a timing hopper with two exits. Under each exit a weigh scale is positioned to check the weight of the counted, mixed product, before it is bagged.

If the mix is underweight by 5g or more, an individual product will be deposited in the scale, delivered from the ninth counting machine, overcoming the cost of recycling a rejected underweight manually. Once the average weight of the product mix is accurate, the mix is

deposited in the vertical bagger.

In comparison to a multihead weigher, this system offers the advantage that both the weight and quantity of product can be guaranteed – with a multihead weigher only the total weight can be guaranteed.

Finally, Easiweigh has announced the Easi-count high speed linear counter with an intelligent optical eye system said to give particularly accurate results. Operating speeds up to 60 packs a minute and an option of up to 12 lanes are available, depending on requirements. The differing lane configuration allows it to handle a wide range of products including frozen and fresh produce.

In summary, a machine which can satisfy the polar demands of faster speeds and greater flexibility is still the holy grail of pharmaceutical and confectionery counting. But unless the operating principles of counting machines undergo a sea-change, any future improvements in this area are likely to be incremental rather than revolutionary.

At the same time, ancillary features such as tablet inspection are becoming more important, as is the ability to integrate the weighing and counting operations. ■

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Bigger packs - smaller packs: Cutting heavy lifts

THE MANUAL HANDLING DIRECTIVE, WHICH AIMS TO ELIMINATE ANY MANUAL HANDLING TASKS THAT POSE A RISK TO EMPLOYEES, HAS TENDED TO POLARISE BULK PACKAGING INTO BOTH SMALLER AND LARGER CONTAINERS.

One principal driver has been responsible for changing the way in which large or bulk packs are produced and sold – the Manual Handling Directive, which requires employers to control and preferably eliminate all manual handling tasks that pose a risk to their employees.

Research into strain injuries in general and back injuries in particular indicates that there are significant risks of injury when people handle loads weighing over 25kg and that injuries can occur with loads as light as 15kg if someone is handling them repeatedly.

So one response to this problem has been to instruct suppliers to deliver materials in smaller sizes, so that the weights being handled are reduced to a safe level for manual lifting. A typical example of this is cement.

Another response to manual handling problems is to eliminate manual handling altogether and have materials delivered in bulk packs, such as IBCs, which can only be moved with pallet trolleys or fork trucks. This solution has the advantage of not only eliminating manual handling, but also reducing packaging waste because a 1 tonne reusable IBC can replace 40 disposable paper sacks.

Indeed, on-pallet drum filling systems were introduced to eliminate a handling activity altogether – the depalletising of empty drums ready for filling on a single drum system and their repalletising for onward transport once filled. With these more recent fillers, the drums remain on their pallets throughout the operation.

There are three basic options in terms of dosing: piston, flowmeter or filling by weight, each with their merits depending on the application. However, as UK manufacturer Masterfil points out, the weigh filling option is often chosen since it requires no priming and delivers a full pack on the first shot following a changeover.

Masterfil makes all types and is currently



One machine – several applications: Masterfil on-pallet flowmeter filling machine handles jerrycans, drums and IBCs

building a typical on-pallet drum filler for a French agrochemicals company based, in this case, on a weighcell. The filling lance is manually positioned, with powered vertical movement for the boom and lance and two sets of controls at either end of the boom.

Duplicate controls

These duplicate controls are standard on Masterfil on-pallet fillers and allow the operator to work from all sides of the pallet and manoeuvre the lance accurately into the bung holes without stretching, particularly important when 5 x 4 layers of 25 litre drums are being handled. Alternatively Masterfil is able to provide fully automatic operation.

For cleaning, Masterfil offers a simple system in which the filling lance is clamped into a scabbard and cleaning fluid pumped through the entire system, cleansing the internal dosing parts and also the outside of the lance in a single operation.

Initially, most on-pallet filling systems employed a counterbalanced or driven filling lance, guided from one drum to the next by an operator. Now, however, semi and fully-automatic systems are available.

For example, an on-pallet drum weigh filler, with a simple teaching system for bung hole coordinates is now available from German bulk liquid filling specialist Feige, represented in the UK by Springvale Equipment.

When bung hole position is usually random, such as with four 200 litre drums on a pallet, the operator uses a joystick to identify the X-Y co-ordinates of each bung hole to the controls and allow the drums to be filled automatically. Alternatively a template is used, and the bung holes aligned with it manually. The filling valve then moves automatically to these pre-programmed points.

When jerrycans or similar interlocking rectangular containers are being handled, and bung hole position is pre-ordained by the palletising pattern, a height adjustable template, carried on pneumatic cylinders, is clipped over each layer of containers during filling, ensuring that containers with offset bungs have been palletised in the correct orientation.

Since bungholes are kept in a consistent position, the operator need only register one or two positions for the machine to know the position of the rest.

Either way, once bung hole positions have

semi-viscous liquids such as lube oil, or to fill from outside when high viscosity products such as grease are involved.

A vapour extraction system that operates through a jacket around the filling lance – so reducing the amount of vapour-laden air that requires scrubbing – is also available along with the more traditional gas hood systems.

One of the latest Feige machines to be delivered in the UK by Springvale is a type 37 automatic drum-on-pallet machine which is being used by International Flavours and Fragrances (GB), Haverhill, to fill a range of ingredients into 4 x 200 litre drums placed on a pallet.

The machine fills by net weight and so incorporates a weigh scale on which the pallet stands while the drums are filled automatically in turn, using a template.

For higher throughputs, and handling hazardous chemicals, Feige also builds completely automatic in-line drum fillers which can be enclosed in a chamber, flameproofed and equipped for nitrogen purging.

French manufacturer Pack Realisations, represented in the UK by Integrapak, has recently

Bespoke line handles food ingredients in drums and IBCs

Weightron Bilanciai has installed and commissioned a bespoke caramel filling line and mechanical handling system to handle a variety of containers, drums and IBCs for the food ingredients division of the Healy Group, at Bardon Hill, Leicestershire. Based on a weigh-fill StrongArm filling machine, the line handles a wide range of viscosities from free-flowing liquids to heavy treacle.

"The design of the line gives us the best of both worlds and allows us to accommodate the different filling requirements for the wide range of end customers," explains Healy Group operations manager Mervyn Penson. "Although the majority of caramel is shipped in bulk to food and beverage manufacturers, there is a growing requirement for smaller quantities in more versatile formats."

For longer runs of the same product, the filling system can be set to fill 25kg screw top containers automatically. To fulfil smaller orders, which may be made up of different

extended its range of rigid container filling machinery with a rotary indexing filler-capper for drums, the PR6/2000 series E.

Containers are accepted onto a starwheel and indexed to the operating stations for orientation, taring, pre-filling, net weight filling, cap-



In-line: Feige automatic drum filler with enclosure

been learnt, filling is carried out automatically and the operator is released to carry out other tasks such as de-bunging the next pallet load, bunging previously filled containers, labelling, pallet removal and so on. The pallet load is automatically tared before each container is filled.

A further on-pallet filling system from Feige is equipped with a vision system to locate the bung holes of drums or jerrycans automatically and then de-bung, fill and bung – all without operator intervention once the pallet has been positioned.

Like other systems in the company's range the filling lance can be programmed to operate below surface for flammable or foaming liquids, to fill from just inside the bung hole for



Rotary: Complete rotary drum filling-capping station and palletising system from Pack Realisations



Filling a variety of containers: Weightron Bilanciai weigh-fill line handles caramel for the Healy Group

size containers including 25kg pails, 250kg drums and 1000kg IBCs, the line can be switched over to semi-automatic mode.

The filling head is carried on an articulated arm supported by a compact central pillar, and can be moved easily to give a full 360deg working radius with a reach of over 2 metres, so

ping the bunghole and crimping the cap. The PR6/2000 can be equipped with one to three filling stations, giving an output up to 120 x 200 litre drums an hour.

Pack Realisations points out that the indexing mechanism makes the machine particularly flexible and able to handle a range of containers from 20 to 250 litres. Format changeovers are said to be simple and quick – less than 15 minutes – as a result of its 'Click & Play' tooling method. Height adjustment for all stations is centralised with these and other format settings held in memory.

Optional equipment, aimed largely at flammable or aggressive products, includes cabinet enclosures for fume extraction, nitrogen injection before and after filling, capping under pressure, and a CIP system.

Complete turnkey lines are also available, such as a recent installation by Pack Realisations at a petrochemical site in France. This is designed to operate in an explosive area in accordance with ATEX regulations and includes an automatic infeed table carrying up to 40 x 200-litre drums, a PR6/2000 series filler-capper, labelling equipment and a palletiser, all built by the company itself.

The first rule of powder filling is that appar-

offering optimum filling versatility around the centre of the machine.

In automatic mode, the arm is locked in position with the filling lance positioned above the conveyor. In semi-automatic mode, when filling different size containers, the lance is moved manually.

ently similar powders can behave quite differently within a filling machine.

In theory, the bulk density and angle of repose of a powder are the equivalent of the specific gravity and viscosity of a liquid and should therefore define the powder. However, unlike most liquids, the bulk density and angle of repose of a powder will in practice vary from batch to batch and even from dose to dose. Moreover, what is frequently not recognised is that powders have two states, a dynamic state in which they are fluidised and can be moved and a static state when they are settled.

Dynamic bulk density

The static bulk density can be measured, but the dynamic bulk density can often only be guessed at. The bulk densities of these two states can be quite different and the energy needed to fluidise and the time taken to settle a powder can vary widely. Large particle sized powders such as dry sand will fluidise and move very easily and settle very quickly, while small particle sized powders such as icing sugar take a lot of shifting when compacted but, when fluidised, behave like water and are slow to settle and compact.

Inevitably, most products lie somewhere between these two extremes, but the success of

In the automatic mode, rectangular 25kg containers are automatically indexed along the powered conveyor before stopping underneath the filling lance on a section of conveyor supported by a stainless steel 60kg capacity weigh platform.

At this point the weight of the empty container is automatically tared out and the filling lance descends just inside the neck of the container, with two speed filling employed to ensure optimum accuracy – fast to 95 per cent and then a trickle feed.

Following capping, containers are removed from the conveyor and stacked on a pallet using a pneumatically powered lifting arm. Containers are filled in under 20 seconds – depending on viscosity – to a tolerance of $\pm 10g$, says Weightron Bilanciai.

In semi-automatic mode, the system employs a stainless steel floor scale with three 3000 division ranges – 0-300kg x 100g, 0-600 kg x 200g and 0-1500 kg x 500g – to allow different size containers to be filled on the same machine at the same relative accuracy, saving time and cost.

In this way 25 kg drums can be weighed to $\pm 100g$, the 250kg size to within $\pm 200g$ and the IBCs to within $\pm 500g$.

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a particular powder filling system depends not only on the accuracy of measuring out the product and its ability to cope with changes in bulk density, but also on how quickly it can take the product from the dynamic to the static state.

Powders that are difficult to settle can be dealt with in a number of ways. These include filling the fluidised product into an oversized bag and letting it settle off line before sealing, filling the fluidised product and extracting excess air by vacuum on line (a process sometimes called vacuum densifying), or filling the product in a compacted state. Settling by vibration is probably the most widely employed.

Last year Arodo announced a new pack de-aeration system – based on the vacuum densifying principle – that enables all air to be removed from the product and the bag or sack sealed without perforations. Originally aimed at the cement industry, this process has now been found suitable for any powdered material that packs with entrained air, such as milk powder. In fact, Arodo reckons that bag volumes can also be reduced, in many cases up to 50 per cent, and has a self-contained pilot plant that can be shipped to a potential customer's site to test the process under real conditions.

"Our experience tells us that factors such as

BULK LIQUIDS AND POWDERS

temperature, moisture and the type of transfer system to the packing line can dramatically affect a material's characteristics, which cannot sometimes be re-created in tests within our factory," says Arodo.

Indeed, the vacuum densifying approach has a number of advantages in bulk packaging, not least that the density of the product can be adjusted to give sacks the optimum rigidity for secure palletising. Cleanliness and lack of dust is another.

Bottom up filling is also a way of countering dust and helping the powder settle quickly.

For example, All-Fill has just supplied a dual head automatic system to a German company, for dosing drums with 75kg of micro-cellulose powder, replacing a large weighpan type system which required violent vibration and was extremely dusty.

The solution provided by All-Fill features tare weighing of the empty drum, full height container lift to provide a bottom-up fill of the powder without aeration and consequent dust generation at the first bulk fill head, and gravimetric weigh-filling to an accuracy of 20g at the second top-up head.



Bottom up filling: All-Fill system handles 75kg drums of micro-cellulose powder

New from Chronos Richardson Systems Europe is the Chrono-Fill PBS 500 open-mouth sack filler which can handle 5-50kg bags of powders or granules at speeds up to 700 an hour. The complete system includes weighing/dosing unit, bag placing, bag filling, bag closing and bag transportation modules in a compact layout that requires minimum floor space. A fully integrated PLC control system is also said

Bulk bag discharger transforms output

Electrical transformer manufacturer Carroll & Meynell has increased output significantly following the installation of a Spiroflow bulk bag discharging and conveying system to handle the silica sand used to 'pot' the transformers.

Previously sand was received in 25kg bags, emptied into a hopper and the hopper raised over the transformers by fork truck, a time-consuming process.

Now sand is delivered in 1 tonne FIBCs and carried by Spiroflow flexible screw conveyors up to small holding hoppers above two production lines for discharge into the transformers.

to reduce installation time.

At the heart of the PBS 500 is a light and fast bag transfer system, which Chronos Richardson says helps ensure that product contamination is eliminated from bag placing through to closing, while a bottom-up filling system is available to meet the hygiene requirements of the food industry.

Options include bulk material feeding systems, air evacuation devices, vibration systems, densification modules, bag closing, labelling and marking devices as well as palletising and load protection systems.

Fills up to 25kg

German built Behn + Bates bulk powder filling machinery was shown in the UK for the first time at last year's PPMA Show by agent Springvale Equipment which highlighted a new valve sack filler developed to handle free-flowing powders for fills up to 25kg, gross or net weight.

For hygiene in the food industry, the machine incorporates a purpose designed filling spout with integrated bag de-aeration, an easy clean surface, and power cabling located in the upper areas of the housing, outside the dust area. Bags are sealed at the filling spout by ultrasonics.

Indeed, complete containment to avoid spread of dust and noise is often required, which is one reason, says Springvale, that Behn + Bates has been particularly successful in the food ingredients market with the Integra Plug 'n Pack system.

Springvale points out that the Plug 'n Pack system combines the bag placement, filling and sealing stations in one compact cabinet so



Unloading sand: Spiroflow bulk bag discharger and conveyor system at Carroll & Meynell

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forming a dust-tight and low-noise fully automatic filling plant that can be housed in tight spaces. As a result, commissioning times are also said to be particularly short, hence the Plug 'n Pack name.

One recent installation outside the food industry is at a German animal feed producer for filling grass seed and animal feed into 10 and 25kg polyethylene and paper valve sacks at the rate of 180 an hour. ■

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For full details of all PPMA members able to supply equipment for handling bulk liquids and powders, consult the PPMA machinery finder service, tel: 020 8773 8111, or visit www.ppma.co.uk

Agrochemicals filling line offers Versatility and accuracy

A NEW FLOWMETER BASED FILLING LINE – INSTALLED IN LIMITED SPACE – DEMONSTRATES HOW A BROAD RANGE OF SMALL AND BULK PACKS OF LIQUID AGROCHEMICALS CAN BE HANDLED EFFICIENTLY AND WITH HIGH ACCURACY ON THE SAME EQUIPMENT.

Agricultural chemicals manufacturer Nufarm UK, at Belvedere, Kent, has brought its packaging in-house with a substantial investment in a new automatic filling line capable of handling some 20 million litres of herbicide a year. The line was designed and commissioned in under six months and only requires three operators to run it.

The line at the moment operates on a single shift and is scheduled to pack some 6 million litres in its first year of operation, from an area of just 25 metres x 25 metres.

Central to the line is a purpose-built Masterfil eight head mass flowmeter filler, chosen for the intrinsic accuracy of flowmeter machines, ease and security of cleaning, and the capacity to handle a broad range of container sizes, from 1 to 20 litres.

“Bringing all filling and packaging in house gives us better control of quality and logistics,” explains Phil Dickinson, formulation manager at Nufarm’s Belvedere plant. “Mass flow meters are used elsewhere on the site and we find them to be one of the most reliable forms of measuring available. Cleaning is also very secure, since they are based on a straight through tube.”

An Australian company, Nufarm acquired the Belvedere site in 1994 – its first outside Australasia – and at the same time set about expansion, now manufacturing in 14 countries and with marketing operations in 20. Belvedere packs for both UK and parts of the European market, currently filling some 20 different formulations of herbicide.

Previously the site carried out only a small proportion of its filling and packaging, using a low-speed line equipped with a single head filling machine, with the remainder handled by contract packers.

The new line was designed and supplied by Masterfil. It runs down three and a half sides of a refurbished 25 x 25 metre building, extending



Flowmeter filling: The heart of the Nufarm line is an eight head Masterfil machine

from a pallet lift and infeed table for containers, stretch sleeving, filling, capping, labelling, checkweighing and induction sealing through to end-of line. Speed is 14 containers a minute for 20 litre jerrycans through to 40 a minute for round 1 litre bottles. Other sizes handled are 5, 10 and 15 litres.

Container flow crucial

With minimum space available, and little or no room for accumulation between the various items of machinery, start and stop queuing and control of container flow has been crucial, as Phil Dickinson explains.

“There is less than a metre between some machines, yet when the line is working on 20 or 15 litre containers – which have the same foot-

print – we’re looking at controlling a block of eight containers 2.4 metres long. In spite of the space restrictions, Masterfil has provided an excellent means of controlling the line, which we can set up to optimise production on the different size containers.”

From the infeed table, which has an adjacent pallet lift to allow containers to be swept manually across, a layer at a time, the empty packs pass to a stretch-sleever. Servo driven, the machine is able to decorate containers of 5-20 litres with a conventional stretch sleeve and also apply a ‘sleeve booklet’. This consists of a sleeve with the material extended beyond the seam to form two additional flaps held in place by peelable adhesive, so providing user information on four pages of virtually the same area

as the front panel of the container.

However, as Phil Dickinson points out, the sleeve booklet is in effect three layers on one side and a single layer on the other, so the sleever chosen had to be capable of fine control over tension to avoid risk of tearing during application.

Filling then takes place on the eight head Masterfil mass flowmeter machine. Apart from high accuracy, which is better than ± 0.2 per cent, or $\pm 40g$ on a 20 litre fill, the flowmeter dosing system allows Nufarm to change over quickly and securely using a new sequential CIP approach developed in conjunction with Masterfil.

Cross contamination eliminated

As filling plant team leader Martin Childs points out, with both selective and total water-based herbicides in the product portfolio, the slightest risk of cross-contamination had to be completely eliminated.

"Since the flowmeters have no moving parts they can be flushed through by hot water as easily as a plain pipe," he explains. "However since eight heads are involved, and there could be a pressure drop that would reduce cleaning efficiency, we called on Masterfil to give us a system in which each head is cleaned in sequence by full pressure."

This has proved successful and Masterfil has adopted the system as standard on other flowmeter machines.

Manual mechanical changeover on the filler involves adjusting the side guides and the pitch of the nozzles to suit different size containers, while nozzle height is motorised and forms part of the product program selected from the control panel, along with fill volume, flow rate and the speed with which the bottom-up filling nozzles rise to avoid foaming.

To adjust nozzle pitch, eight containers are run into the machine against the gate and the nozzles simply lined up with the necks. This, explains Martin Childs, has proved much simpler than marking the support beam since container width can vary and nozzle position may even need to be adjusted during a run in compensation.

Password protection for the main program on each product also allows operators to adjust speed and fill volume to counter any variations in the product batch, but without changing the base settings permanently.

From start to finish, a full container and product changeover can be accomplished well

within the two hours that it takes for the final wash water to be analysed within Nufarm's laboratory and the machine declared clean for handling another product.

Nufarm employs closures with two types of tamper evidence: ratchet style circumferential tear-off skirts or induction sealing. Both are applied by a Mastercap single spindle machine, fed by an elevator-unscreamer. Six different cap sizes are handled.

The Mastercap machine is one of the latest from the company and has been engineered for higher speed than its predecessors. This includes a new design of gearbox, which provides smoother indexing of the capper's starwheel, so allowing faster transfer between infeed and capping station without risk of slopping.

Other improvements include a wider cabinet to improve access for changeover and a larger diameter starwheel to cater for containers with a long footprint, such as Nufarm's 15 and 20 litre jerrycans. Motor-driven spindles are now used to change the height of the capping head for a different container, giving smoother and more accurate adjustment.

Nufarm stretch-sleeves some of its products but others are labelled. So following the capper is a front-and-back labelling machine with an additional side belt on the outfeed to allow 1 litre bottles to be given a full wraparound label. The machine also includes a top hold-down belt to ensure containers cannot topple.

Checkweighing is carried out on two machines, one for the 1 litre bottles and a heavy duty machine for the remaining sizes up to 20 litres.

Nufarm also uses a standalone scale to make regular additional weight and other QC checks as part of its E-marking procedure now granted approval by NWML. The machine calls for samples to be placed on its weigh platform and interrogates the operator with a series of questions including the condition of the container, closure label, coding and label position. Data is fed back to create records on a production office PC.

Tighter tolerances than required

However, as Phil Dickinson explains, "Flowmeter filling means we have been able to set ourselves tighter tolerances than legislation requires." For example, although average weights legislation demands no more than a $\pm 150g$ tolerance on a 10-litre container, Nufarm is able consistently to obtain considerably higher accuracy.

A counter-balanced bottle lifter has also been installed, to avoid heavy manual lifting by operators when transferring bottles to the stand-alone checkweigher.

Induction sealing, where required, comes next with containers passing below a machine capable of operating at a range of up to 25mm to cater in particular for caps that sit in the recess below the shoulders of jerrycans.

Nufarm has also installed a vision system a metre or so upstream to monitor caps automatically and confirm the security of each closure. A further vision system checks the date and batch codes printed on the containers at this stage by an ink jet.

Case-packing is carried out on a heavy duty bottom load machine which creates collations of 2 x 1 for the 10 litre size, 2 x 2 for the 5 litre size and 2 x 4 for the 1 litre bottles. Larger containers go through the machine on a bypass direct to the palletiser.

The machine is equipped with an extended horizontal magazine, allowing up to 150 blanks to be held and give unattended running time of about 15 minutes on 10 litre containers and 45 minutes on the 1 litre size.

Cases identified on top

A large character ink jet printer is then used to place a product description on the top of the case – for improved visibility to delivery drivers – while a case labeller adds a generic label to the face. A case checkweigher then ensures that no packs are missing from a case.

A robotic palletiser is equipped with interchangeable gripper and suction cup heads to handle cases or jerrycans and also picks and places empty pallets ready for loading. Layer pattern programming on the machine also includes facing cases so that all labels are to the outside of the pallet load.

Finally there is spiral stretch-wrapping. This is carried out on a fully automatic machine, which is able to include a top sheet within the wrap for enhanced load protection.

"We now have all the benefits of the product consistency and accuracy that come from fully automatic packaging, along with a considerable rate of output," says Phil Dickinson.

"Twelve months ago we were novices in terms of running filling lines, but with the help of Masterfil and the other machinery manufacturers and an excellent skilled workforce we have been able to develop our own expertise." ■

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Contrary to some predictions PLCs are thriving

PROGRAMMABLE LOGIC CONTROLLERS (PLCs) ARE DEVELOPING ON SEVERAL FRONTS AND LOOK SET TO REVERSE SOME OF THE PREDICTIONS MADE FOR THEM JUST A FEW YEARS AGO. THE TECHNOLOGY IS NOT JUST SURVIVING, BUT POSITIVELY THRIVING.

It's not long ago that the death of the PLC was being predicted as, it was thought, PCs (personal computers) would come to dominate. But in a reversal of fortunes, it now seems that the PLC is gaining ground at the expense of the PC.

Large PLCs are moving into the domain of plant-wide control – SCADA (supervisory control and data acquisition) and DCS (distributed control systems). They are not actually replacing computers, but are complementing them, allowing simpler, more efficient and flexible architectures to be realised. And the functionality that has been developed to allow this to happen is migrating down to medium-sized and even compact PLCs.

Large PLCs now typically have two processors: not to double data handling capacity, but rather to provide redundancy so that if one processor fails the other instantly and seamlessly switches in. This capacity is vital when controlling a continuous production plant, such as in oil refining, or those intensively used machines that are common in plastics production, paper mills and so forth.

Medium and compact PLCs are increasingly based around 'multi-processor capability', but this is a rather different idea – add-on modules dedicated to specific functions. Each module contains a single specialist processor and clips straight onto the main body of the PLC to perform a specific function, such as communications, motion control, protocol conversion, or temperature monitoring.

When a PLC has expansion modules fitted, its central processor unit (CPU) performs the core machine monitoring functions, while processors in the clip-on modules focus on their specialist functions. Some of the specialist functions require considerable processing capability, which if performed in the CPU would slow down or otherwise compromise the overall performance of the control system. Most PLCs can be



PLC with two racks: New Mitsubishi FX3U has both left and right hand racks which allows the third generation PLC to be configured for optimised program construction and high speed operation

fitted with several such modules and so configured to meet the exact requirements of the machine they are controlling.

While many of the modules' functions are not new to compact-medium PLCs, several represent a significant step forward for the technology. An obviously important new module provides Ethernet capability, allowing PLCs to interface with complete 'shop floor to top floor' production control and enterprise management control systems.

Other modules that are opening up whole new worlds to the PLC provide IT functions, such as database management, web connectivity, word processing and spread sheets. The key role these modules fulfil is to offer person-friendly – as opposed to just engineer-friendly – direct interface to machine control and production information. With them it is possible, from a fairly simple control system, to produce management and production reports, trending information and alarm analysis in a format that is readily understood by engineers and non-engineers alike.

This opens the possibility of one seamless management team running complex manufacturing and production plants in real time. While there are few such installations yet anywhere in

the world, it is no longer technology that is holding them back.

It is also to be noted that PLCs are advancing on some comparatively routine fronts. In recent years they have become faster at processing data, more reliable, I/O capacity has increased and memory is an order of magnitude greater.

New dawn arrives

An early indication of the shape of things to come may have been provided with the launch last autumn of Mitsubishi's third generation compact controller, the FX3U. The original FX, launched 25 years ago, was the world's first compact PLC (linguistic fashion has previously referred to them as 'micro' and 'brick' PLCs) and it defined what has become one of the most important tools available to the machine control engineer.

The new FX3U looks like proving just as revolutionary. As with a conventional controller, it can be expanded to the right hand side with input and output blocks and special function blocks. These communicate with the CPU over an enhanced bus that automatically switches to high speed mode when required, providing an increase in operating speed of nearly 500 per cent.

But the most revolutionary development is an adapter expansion bus on the left hand side of the unit, onto which additional analogue, temperature and positioning blocks can be mounted.

The major benefit this provides to the user is that adaptor units no longer require the use of application software to configure and operate a control system. All control is through direct access data registers and setting bits. This gives rise to faster, easier initial set-up, optimised architecture, simplified use and above all processing speeds so much higher that they stand to completely redefine the expectations of potential users.

The FX3U appears to be the precursor of a new generation of compact programmable controllers, and it is notable that most manufacturers say they will be updating their offering in this sector within the next year or two. Whether they follow Mitsubishi's lead or not has yet to be seen, but it may be that the new unit will be as influential as the first FX was in the 1980s.

Logic blocks

While it has taken 25 years for compact PLCs to get to their third generation, the smaller, simpler logic blocks have done it in under ten years. Logic blocks were originally introduced as 'slightly programmable' replacements for the trusty relay switches that had served electrical engineers for as long as anyone could remember.

The real reason for developing logic blocks was probably to save space in control cabinets, since an array of relays can take up a disproportionate amount of space. However, once six or a dozen switches had been built into a single unit, it was just too tempting not to add a bit of solid state processing capability.

Originally marketed as relay replacements – and priced accordingly – it was not long until users realised that they could perform small programs of logic with them and thus control, say, a small machine or a single function within a larger machine. The designers took this on board and a second generation soon followed that reduced the hard wiring required for installation and increased their programmability.

Third generation logic blocks, already on the market from some manufacturers with others expected to follow suit in 2006 and 2007, are now definitely closing the gap with compact PLCs. At present it looks like logic blocks will never form a true continuum with PLCs, but perhaps we need to wait and see what the fourth generation will bring – which at the current rate of developments is probably only three years away.

However, one of the limiting factors for logic blocks is the programming method. While most are programmed using a few simple push buttons and even have a built-in micro screen showing a graphic of the program as it is built, they are in fact based on old-fashioned ladder logic. While this is quite easy to use for simple and even moderately complicated programming, it is time consuming and does not lend itself to certain maths based functions and other high level operations.

Additionally there is a generational shift to be considered. Younger engineers have been brought up in a world of computers and are only truly comfortable using software programming tools. To them, ladder logic is as arcane as slide rules and pneumatic logic. So users of PLCs want to leave ladder logic behind and perhaps logic blocks will have to become programmable in a high level language too.

A similar trend can be seen in the take up of IEC 61131, the international standard for structured programming. This has been around for a good few years and most engineers are familiar with it. But while older engineers are equally happy without it, younger engineers treat it almost as their default setting and use it virtually constantly.

End users are now increasingly requiring that their specific applications are standardised to IEC 61131 and often write their own function blocks. This allows them to keep control of their programs, while making it easier to change suppliers and train up new personnel. As a result,

software houses are using it more and more, which in turn places a demand on hardware manufacturers to increase the memory capacity on their PLCs (the Mitsubishi FX3U for instance has eight times the memory capacity of its predecessor).

A final trend worthy of comment is the building in of PLCs into other field devices such as inverter drives and HMIs (human machine interfaces). Just a few years ago these seemed like novelties dreamt up by bored hardware designers in the same way that automotive engineers produce concept cars. But like the concept car they have indicated possibilities worthy of exploration.

It is notable that the first companies to market combined devices have tended to be those, such as specialist drives makers, without a PLC in their catalogue. This allowed them to expand their sales somewhat into the PLC domain. But now users are beginning to cotton onto the fact that combined units can be cheaper to buy and easier to install than separate components.

Experienced production engineers – possibly otherwise known as world-weary old cynics – will question their use on grounds that a small parts failure will shut down a greater part of their capacity – and indeed this is valid grounds for concern. But the flip side of the situation is that OEMs are always looking for ways to trim costs from their machine building activities. So perhaps combined units will attain much-favoured status with OEMs and in this way gain themselves a defensible market share. ■

Compact general purpose PLC launched

Panasonic has introduced a new general purpose, compact PLC aimed in particular at small and medium sized machine control.

The FP-X is said to be extremely flexible and is available in three controller sizes of 14, 30 and 60 I/O points. Each controller is expandable with its own I/O system, but can be further expanded with existing I/O combinations from the established Panasonic FP0 range, allowing a total I/O count of up to 366.

In addition to these capabilities there is a range of plug-in cassette modules that allow the FP-X to perform numerous functions including serial communications, high speed counting and analogue processing.

An 85-265 VAC power supply has been incorporated in the FP-X allowing use throughout the world. In addition, the OEM user has the ability to eliminate the possibility of their



program code being copied by disabling the ability to upload the PLC code. This feature is in addition to an eight digit password protection facility.

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LOGOPAK INTERNATIONAL

Print-apply caters for top-of pallet labelling

Print-apply labellers supported within 4.2 metre high structures – so that tracking labels can be placed on the tops of pallets – are among 35 labelling machines supplied by Logopak to the new Quinn Glass factory at Elton in Cheshire.

The installation, which is Logopak's largest single UK order to date, is in three sections.

The first applies labels on the tops of pallets at the exit from individual palletisers. These labels are internal and are for tracking the pallet through the conveying system from palletisation to labelling, and then to storage.

Since pallets vary in height from 1.4 up to 2.7 metres, and are transported at this point on 600mm high conveyors, the Logopak 906 TP print-apply

machines are carried in a 4.2 metre high support structure and adjust to the height of the pallet.

The second part of the installation is standard EAN labelling on

two adjacent sides of stretch-wrapped pallets for the finished product area using Logopak 920PF and P units as well as Logopak VLP off-line systems.

The third is tray and EAN pallet labelling in the filling and packing hall using Logopak 920PF and the newly developed Logopak

515b90/600 print-apply units.

All machines operate from within enclosures to protect the equipment against an "oil laden" atmosphere and to ensure that the label adhesive retains its tack for secure application.

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Labelling on top: Logopak 906 TP machine at Quinn Glass

ADVANCED DYNAMICS

Bespoke labeller seals ends of gift-wrap rolls for M&S

Shrinkwrapped rolls of gift-wrap paper supplied by Hallmark Cards to Marks and Spencer are now labelled at both ends by a bespoke system from Advanced Dynamics, allowing extra product information to be carried and preventing shoppers tampering with the paper.

"Consumers often handle rolls of gift-wrap by pushing their fingers through the shrink-wrapping at the end of the roll, which damages the paper," explains Hallmark's operations manager Chris Mallows.

"The new equipment from Advanced Dynamics ensures product security and protection of the wrapping paper, so cutting down markedly on the number of rolls returned as damaged."



End protection: Labels protect wrapping paper from damage

Labels are applied by two Eurokett Junior 115 labellers operating either side of a purpose-built conveyor, which carries the rolls long edge leading past the applicators.

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SESSIONS OF YORK

P-s labeller converts into three different versions

The new Sequence Total pressure sensitive labeller is said by Sessions to be the most flexible in the Sequence series and can be converted into three different versions with optional accessories.

The basic configuration, the Sequence 300/4 model, labels round, square, rectangular and oval containers. This is then modified with extra large powered reel holders allowing the machine to label large containers at high speeds.



Three-in-one: Sequence Total labeller converts into three versions

In addition, the Sequence Total can be adapted with the transposition of a three-roller drive station that will allow round products to be labelled with full or part wrap labels, either randomly or in register.

The three-roller registration module is inter-changeable with a standard roll down unit and can be changed over within minutes, says Sessions.

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AEW DELFORD SYSTEMS

Entry level labeller can apply top and bottom labels

A top and bottom labelling version of the LS40 entry level label applicator has been launched by AEW Delford Systems to allow promotional message to be accommodated as well as information such as ingredients, cooking instructions or recipe ideas.

The machine, which can run at speeds up to 150 packs a minute, handles labels up to 100 x 150mm as standard, although larger labels can be used with a simple web upgrade.

The LS40 is built in stainless steel and is available in a choice of configurations to suit individual line requirements, including



Top and bottom: LS40 entry level pressure-sensitive labeller

mounting on a floor stand, on an existing conveyor or with its own integral conveyor.

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WEBER MARKING SYSTEMS

Wine bottler takes laser coding route to traceability

Independent bottler Kingsland Wines & Spirits, Irlam, Manchester, has chosen a Weber SolarJet 30W laser coder to add traceability information to wine bottles filled on one of its high speed lines.

The machine produces a permanent code 4mm high and runs at speeds up to 300 bottles a minute, while an adjustable marking head allows the unit's orientation to be changed to suit individual applications.

Kingsland has now selected a second coder for another line and is to install two more later this year.

T: 01875 611111

E: sales@weber.co.uk

SATO UK

RFID tags from desktop printer

RFID tags can now be printed and encoded in house, on demand, with the updated Sato CL400e series desktop thermal label printers.

The CL408e and CL412e barcode printers – with resolutions of 8 and 12 dots/mm respectively – are said to offer the latest in UHF RFID multi-protocol technology, supporting Class 1 and Class 0+ as well as ISO 18000 standards, now widely adopted throughout Europe.



Sato's RFID module also supports worldwide frequency bands for use around the globe.

T: 01255 240000

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F JAHN & CO

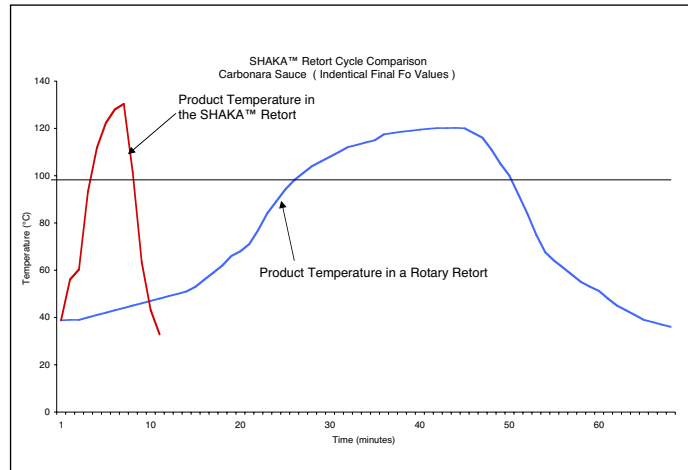
Retort shakes product for ultra-fast sterilisation

A retort system that reduces sterilisation times by up to 80 per cent as a result of shaking the containers to allow faster penetration of heat into the food is to be available soon from French manufacturer Steriflow, represented in the UK by F Jahn & Co.

Steriflow has signed a licence agreement with Zinetec, the inventor of the Shaka system, and expects to produce the first laboratory scale model in March of this year. An industrial scale version is to be introduced in the summer.

As its name suggests, the Shaka agitates the product through horizontal movement of the baskets, achieving a frequency of 100-200 cycles a minute.

"The reduced process time has a highly positive impact on the quality of the product – colour, taste, vitamin preservation and so forth – compared to that usually obtained with static or rotary



Much faster processing: Comparison of temperature profiles (source: Steriflow)

autoclaves," points out Steriflow.

The Shaka can be used with all types of containers, from rigid cans, glass jars and trays to flexible packaging such as pouches. Products such as sauces, soups, baby food, vegetables or pet food have been tested with positive results, the company says.

In addition, Steriflow points out, the sharp decrease in cycle times

greatly improves the utilisation of the sterilisation equipment, allowing four to five sterilisation cycles an hour.

Development work on the Shaka system took place at CCFRA in Chipping Camden, with a prototype tested by a number of major food producers.

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RECORD PACKAGING SYSTEMS

Polymers lower the cost of chamber style shrinkwrapper

A chamber style shrinkwrapper that uses a high proportion of KF2 engineering polymer for its construction, so reducing the cost of manufacture, has been announced by Record Packaging Systems, UK agent for the Italian manufacturer Minipack Torre.

As a result of its construction and the move away from the rising costs of steel the new Galileo machine sells at £1499 but, says Record Packaging, with no loss of performance.

Innovations in the sealing area include a sealing bar with inbuilt shock absorbers to give precise alignment with the hood for a good seal, while magnets are now employed to hold the hood in place for sealing, improving accuracy and eliminating operator effort.

The Galileo has a sealing area of 567 x 567mm and incorporates a ten-product programme memory with digital display. There is also an optional film micro-perforation system with up to 60 programmes available.

In addition, the product support plate in the chamber can be adjusted to one of two positions and has plastic spacers to lift rectangular product off the plate



Polymer construction: Low cost Galileo shrink chamber

during the shrink process and avoid unsightly stripes on the bottom of the pack.

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New Machinery continues on page 74

FLEXLINK SYSTEMS

Auto resetting for conveyor guides offers rapid payback

An automatic system to reset conveyor guides when product dimensions alter has been announced by FlexLink, which says that payback time can be less than a month if resetting is required five times or more a week.

"The system makes efficient multi-product manufacturing lines a reality as frequent product changes are commonplace in industry today," explains the company. "Automatic resetting of the lines promotes small batch production and increased line utilisation."



Quick reset: FlexLink system resets guide widths automatically

The core of the system is the electrically driven guiding units which control the position of the guide rails along the line. Up to 220 guiding units can be controlled from one cabinet and the system has a repetitive accuracy said to be better than ± 0.1 mm.

The system is designed for dry and wet production environments and can also be used in areas where access for manual resetting is limited or non-existent, such as at ceiling height or in closed areas.
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E: info.uk@flexlink.com

BRADMAN LAKE

Cereal bars cartoned in volume by end-load machine

Bradman Lake has announced a racetrack collator and end-load cartoner combination which, it says, allows flow-wrapped cereal and other confectionery bars to be handled in volume at lower capital cost than robotic top load systems.

"Until now, producing count-line packs of wrapped cereal bars in volume required a carton erector, robotic top loader and three-flap carton closer," explains the company.

"In contrast, the Bradman Lake Racetrack Cartoner collates product, erects, loads and seals end-load cartons at speeds of 350-400 bars a minute in a single machine unit."

The racetrack collator/loader has twin servo-driven belts, each with nine pockets, which can deliver various product counts, including layers, to a synchronised indexing motion SL902 end-load cartoner.



Lower cost: Bradman Lake end-load cartoner with racetrack collator

Cartons from a motorised magazine are erected by a triple-head rotary feeder and loaded into the pocketed infeed conveyor of the indexing SL902 by a compact overhead pusher unit, also servo-driven and triple-headed.

The bars are then loaded into the erected cartons during the

stationary phase of the cycle by a second overhead pusher, replacing the barrel loader used in many continuous motion end loaders.

Two of the new machines have been delivered to South Wales and another to New Zealand.

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ABB ROBOTICS

Compact robot suits range of packing applications

The IRB 260 top loading robot from ABB incorporates conveyor tracking and vision technology specifically for packaging work.

Designed for integration into new or existing production lines, the machine is compact and able to reach close to its base for extra manoeuvrability and space saving, says the manufacturer.



Packaging robot: Compact IRB 260 top loader from ABB

Working range is optimised for an envelope of 800 x 800 x 800mm while maximum reach is 1560mm. Speed is 60 cycles a minute at 10kg payload, and 40 cycles a minute at 20kg payload.

However, maximum payload is 30kg which, says ABB, is high enough to cover more than 85 per cent of all packaging applications. IP67 protection is optionally available for installations involving washdown.

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ANCHOR PLASTICS MACHINERY

Bag maker suits in-house bag-in-box production

A bag-making machine aimed in particular at economic in-house production of bag-in-box packaging has been announced by Anchor Plastics, UK representative of the German thermoforming and plastic welding equipment specialist Kiefel.

The machine is able to create a wide range of bag shapes, with capacities of 3-30 litres, from a single reel of material at speeds up to 30 bags a minute, also attaching the outlet tap.

Typical bag material is a three or four layer laminate, indexed by

a servo driven dual chain, with welding carried out by a 10kN or 20kN pneumatic press. Holes for the flange are generally cut with a simple steel rule and the waste removed automatically.

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SANDIACRE ROSE FORGROVE

Horizontal sachet machinery launched on UK market

High speed horizontal sachet and stand-up pouch machinery built in Barcelona by Effytec is now to be available in the UK from newly appointed distributor Sandiacre Rose Forgrove.

Equipment is available to handle

all types of flat sachets as well as standard and shaped Doypack pouches, with features such as a Euroslot and top or side positioned spouts and valves. Applications include food, beverages and pharmaceuticals.

Sandiacre Rose Forgrove says the machines employ a specially developed sealing system for seal integrity and are able to run up to 20 per cent faster than competitive equipment, but from a smaller footprint.

Single, duplex, triplex and quadruplex variants of the machines are available, with options including automatic film splicing, a choice of liquid or powder filling systems and a re-closable zipper applicator.

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