

# READY MEALS REPORT

READY MEALS MANUFACTURERS ARE INCREASINGLY HAVING TO BALANCE TRADITIONAL CONSIDERATIONS OF COST, LINE SPEED AND SHELF LIFE AGAINST THE RETAILERS' EAGERNESS TO GO UPMARKET, SOMETIMES FAVOURING MATERIALS SUCH AS ALUMINIUM OVER PLASTICS, AND THE NEED FOR FUTURE-PROOFING TO CATER FOR TOMORROW'S UNPREDICTABLE REQUIREMENTS.

INGREDIENTS HANDLING AND PROCESSING

## Growth in stand-up pouches favours post-fill processing

**F**ine control is as essential for post-fill heat processing as it is for pre-fill cooking. New for the Lagarde range of autoclaves supplied by Holmach is the Samantha industrial PC control said to improve accuracy, control and speed of response. Secure access ensures that only authorised personnel can change settings.

With growing requirements for access to batch data, the traceability benefits of the system are also important, explains Holmach managing director Chris Holland. All outputs are in PDF format, so they can be e-mailed or analysed easily, while there is also a range of templates for submissions to regulatory bodies.

Recent installations of Lagarde autoclaves have included Holmesterne Foods in North Yorkshire which is using the equipment for pasteurisation and sterilisation of different products including, for example, ham hocks and lamb shanks in sauce, both packed in stand-up pouches.

Bramigk & Co supplies the Satori Stocktec range of autoclaves for pasteurisation and sterilisation. Control technology is advanced, says director Linda Berrett, and over 2500 units have been installed worldwide. But, despite the experience of Holmach, she says: "There is no specific trend towards autoclaving ready meals. The majority at the moment appears to be cooked and packaged in the conventional way."

Nonetheless, she adds, the growth of sauces and ready meals in stand-up pouches does seem to favour post-fill heat processing, rather than pre-cooking or hot-filling.

D2 Food Systems has its Vortex cook-

quench-chill system, which is said to combine high throughput with consistent results. Recent installations have included systems for cooking potatoes and one for pasta as an ingredient in deli snacks, at Greencore, in East London.

With pasta especially, claims D2 managing director Dave Edwards, this type of process is the only method that will ensure consistent cooking and quality.

### Continuous process

Meanwhile, BFS Europe is now supplying the US-built Lyco Clean Flow cook-quench-chill system which uses a horizontal auger to carry product through the various stages of the machine in a continuous process.

As a result, points out BFS, production and labour costs are reduced and flexibility improved, since there is no need for continual transfer of batches in tote bins, each of which needs to be cleaned and maintained.

Instead, the automatic cleaning cycle between product runs on the Clean Flow can take as little as 15 minutes, the company says.

Process parameter controls and sensors continually monitor and correct conditions inside the apparatus when necessary.

Kecol Pumps has a system said to be ideal for manufacturers needing to transfer high-viscosity pastes and creams from drums and process containers such as IBCs and Eurobins.

A typical application in ready meals, says Kecol, might be triple concentrate tomato paste in single or multiple pallet-mounted drums. The articulated Powerprime air-powered stainless steel pump will decant the contents of four drums on a pallet, without requiring their removal, while residues and product waste are kept to "a very minimal amount".

For dry ingredients handling, Bramigk has the Guerin Systems range, and equipment from IKA, Germany, for mixing and dispersion.

"IKA has supplied equipment to sauce manufacturers for homogenising and also powder and ingredient incorporation into the liquid phase," explains Bramigk director Linda Berrett. "Due to the configuration of the shear zones, it is impossible to get agglomerations of



**Continuous process:** Lyco Clean Flow cook-quench-chill system from BFS Europe uses auger transport

the dry powder into the liquid phase.”

IKA is able to supply mixing and homogenising systems from lab scale up to high-volume batch or continuous machines. Test facilities are available at both Guerin and IKA, Bramigk points out.

### Extending shelf life

When it comes to extending shelf life for ready meals, autoclaving has recently received a lot of attention – and, by all accounts, a fair number of new adherents.

“A number of people in the industry are using, or looking at, autoclaves,” says Dave Edwards, managing director of D2 Food Systems. But, he argues: “Autoclaves have their place for certain products, but not for others.”

In fact, with tray sealers high on the list of equipment that D2 supplies, Mr Edwards understandably champions modified atmosphere packaging (MAP). “The majority of our tray sealers now use MAP, and nowadays, the consistency, speeds and residual levels are all positive,” he explains. “Five or 10 years ago, speeds were much slower, and people worried much more about the quality of the seals.”

It is true, says D2, that some components in a multi-component meal will benefit more than others from MAP. Indeed, with the way the industry is evolving, particularly premium ranges, items such as protein and vegetables may well be increasingly packed separately in future, Mr Edwards speculates. This would allow different methods of extending shelf life to be used on each pack.

For his part, Holmach managing director Chris Holland maintains that MAP and autoclaving each work well with very different types of product. So, for instance, raw and sliced meats clearly benefit from MAP. “Here, you get a shelf life pickup of up to 14 days without having to do much else,” he says.

But, he goes on: “With composite ready meals, with liquids and products that give off gases over time, MAP does not give a shelf life pickup, and the atmosphere inside the pack becomes mixed.” MAP technologies work best, he argues, where individual types of food are packed separately.

Conversely, products said to benefit from autoclave pasteurisation, as well as from its typical 14-to-21-day extension of shelf life, include curries, casseroles and dishes such as chilli con carne.

Some retailers require autoclaving for slower-turnover items in, for example, ranges of

Indian cuisine, Mr Holland explains. But in other cases, manufacturers of these types of ranges autoclave all their recipes – faster and slower-selling – because they believe there is a benefit in flavour as well as shelf life. He estimates that around half the manufacturers of Indian ethnic ready meals in the UK are now using autoclave pasteurisation.

Adding to the debate, Brian Hemsley, sales director at G Mondini points out that the additional shelf life of 12 or 13 days achievable with MAP is undermined by the potential effect on product appearance. “Certain products such as pasta and cheese tend to fuse together, and after a few days the appearance is not good,” he says.

That said, brands and retailers may be willing to absorb the extra cost of MAP in order to gain even only two days extra shelflife, while the appetite appeal remains.

### Seal quality for retorting

Where Mondini tray-sealing lines have been specified in conjunction with retorts, Mr Hemsley argues, the company’s reputation for seal quality has been a major customer consideration. Autoclaving of trays at customers such as Geest and Blue Crest is giving shelf life of 24 or 28 days, he says. But he agrees that best results are obtained with pre-mixed, homogenous products such as Indian meals.

So it seems that the perfect shelf life extending solution for composite ready meals is an elusive goal, and is still likely to involve some sort of compromise between shelf life gain, product appearance and cost.

### For further information:

**Bramigk & Co**  
T: 01245 477616  
E: info@bramigk.co.uk

**BFS Europe**  
T: 01234 240700  
E: sales@bfs europe.co.uk

**D2 Food Systems**  
T: 01582 622111  
E: sales@d2foodsystems.com

**Holmach**  
T: 01780 749097  
E: sales@holmach.co.uk

**Kecol Pumps**  
T: 01746 764311  
E: sales@kecol.co.uk

**G Mondini (UK)**  
T: 01785 812512  
E: sales@gmondini.co.uk

DENESTING, WEIGHING AND DOSING

## Denesting trays in damp and cold conditions

While smooth, reliable denesting is clearly a vital element in any tray-filled ready meals line, difficult conditions can make it hard to achieve.

For example, Sewtec Automation is now offering a twin-magazine tray denester specifically for harsh food environments, having developed the machine for a manufacturer that required a stainless steel unit suitable for the damp, cold conditions of a lasagne line.

The IP65-rated unit, which can be manufactured either in anodised aluminium or stainless steel, features quick-release pre-set magazines for different tray sizes. Either standalone or integrated controls can be specified, as can either central or integrated vacuum and a portable or fixed design.

The maximum tray size is 200 x 350mm, depositing one at a time, and 150 x 200mm when two are deposited simultaneously. The system will denest up to 60 trays a minute and Sewtec says that the air consumption of 0.48 litres per cycle is particularly low for this type of application.

Moving on to the filling stage, manufacturers are understandably wary about how they treat their higher-value meal components and, traditionally, manual feeding has been seen as a cost-effective solution. This was certainly the case at French canned ready meals supplier William Saurin, but is equally often true for chilled, tray-packed ready meals.

Saurin looked for a multihead weigher able to offer the speed, accuracy and reliability necessary for weighing and dosing key elements of its 74 ready meal recipes. Clearly, an ability to handle a wide range of products was essential and a small footprint was also a necessity.

Ishida Europe devised a system consisting of two 16-head weighers, feeding a single custom-designed distribution system. This now allows Saurin to achieve speeds up to 360 containers a minute for a sausage-and-lentil product. Other recipes being handled include cassoulet, turkey blanquette, boeuf bourguignon, tartiflette (potatoes with cheese) and coq au vin.

According to factory director Lionel Maynard, the accuracy of the weighers is such that Saurin can minimise giveaway on high-value



**Twin multihead dosing:** Ishida system for Saurin, France, provides speeds up to 360 drops a minute



**Denesting in harsh environments:** IP65 rated unit developed specifically by Sewtec

components while also giving consumers "a fair deal". Given that most recipes contain meat, hygiene considerations were also paramount.

As many meals become more complex, lines have to be longer, with a wider range of dosing and depositing systems. One recently-installed tray filling and sealing line from Waldner, Germany, stretches to over 25 metres length across four lanes.

### Multi-chamber design

The stainless steel construction, which was installed for a French customer, includes cup slats to run trays in either mono formats or multiple-chamber designs with one or more side pocket. The quick-release mechanism also

allows fast, tool-free changeover, says Waldner UK, and the tray magazine can be changed with equal ease, simply by substituting a different cassette. The line is designed to run at speeds of 40 cycles, or 160 trays a minute, says applications engineer David Pratt.

Fillers for pumpable liquids on the line include a Waldner Unimat system with an X-Y-Z-axis depositor. This provides exactly control over the position and height of the fill into each chamber. The Z axis comes into use where deeper trays are being filled.

For non-pumpable products, Waldner has the Multi-DOS vacuum-assisted pocket filler. This draws accurate weights of product smoothly from a hopper, and places them with equal accuracy. It can be used for items as diverse as vegetables, couscous, rice and pasta.

All the main assemblies can be easily removed for cleaning. In fact, along with ease of operation, ease of access and overall cleanability were among the main reasons why the company won this contract, says Waldner.

The company also supplied the denesting unit at the beginning of the line. In addition, sufficient space has been left in the production area for a third-party multihead weigher and manual feeding, if required.

Like Waldner, Mondini has seen the amount of line space dedicated to the various filling and

depositing technologies grow. Sales director Brian Hemsley says that this stage of a typical ready meal line might need between 12 and 15 metres for the various pieces of equipment, with perhaps an additional 5 metres left for subsequent installations. A checkweighing function can also be included on the line.

"Any company operating in this area will be looking for complete flexibility, and the ability to create new meals and recipes in the future," says Mr Hemsley.

Relying on manual tray-loading to supplement the line equipment will be increasingly viewed as a last resort, he adds, by companies that are keener than ever to cut overheads to a minimum.

### Lasagne a speciality

Lasagne lines, with stations for loading fresh pasta, cheese and other toppings, are one of Mondini's specialist offerings, achieving speeds of up to 120 packs a minute.

For good hygiene reasons, 'stainless steel throughout' is increasingly the 'recipe' followed by builders of ready meal lines. But for some very specific functions, steel may not be the most appropriate material.

For example, Hi-Tech Machinery points out that its Hibar pump is still being installed on ready meal lines, equipped with ceramic rotary valves, now shown to require no maintenance or replacement for over ten years, even when running at 70 cycles a minute. The sleeve is also ceramic.

This contrasts with the performance of other materials used in rotary valves explains sales manager Jim O'Neill. "Most types of stainless steel will try to friction-weld themselves together in a short time," he says. "And with most plastics, you have problems of expansion and contraction. The majority of protective coatings will also wear off, and so require frequent maintenance."

Ceramic, Mr O'Neill claims, has none of these shortcomings and can be machined to very tight tolerances. It gives an especially clean cut-off, he says, and will cut through most large particles if necessary. This is a particularly important capability given the tendency for increasingly large particles in today's recipes, he adds.

Products and components filled using Hibar pumps include sauces with vegetable pieces, Italian sauces incorporating whole cherry tomatoes, sweet and sour sauce and also black bean sauce.

More specialist operations within the filling and depositing stage of the ready meal line include dry herb application and coating with oils or fats. Apple Engineering says it spent many months developing its Herb and Powder Applicator, designed specifically to apply a wide range of dry herbs and spices to meat packed in PET trays. According to Apple, the unit can be adapted to deposit breadcrumbs, savoury powders and flavourings onto a wider range of ready meals.

Saturn Spraying Systems says that the application of fats to frozen oven ready products such as roast potatoes is a significant growth area for the company. Heated versions of Saturn's Discmatic spinning disc machine are being used in conjunction with products coated in garlic-flavoured olive oil, 'basted with beef dripping' and 'basted with butter'. The latest system of this sort was installed towards the end of 2006.

Ethnic ready meals have also benefited from Saturn technology over the past year, says the company, with the flavour marinade being applied to prepared, sliced chicken using Discmaster and Discmatic machines.

The spraying of pizza bases with oil remains a success story for Saturn, with recent orders coming from the UK and Canada. Even customers in Italy, the home of pizza, have come to Saturn for its technology.

**For further information:**

**Apple Engineering**  
T: 01482 824200  
E: sales@appleng.co.uk

**Hi-Tech Machinery**  
T: 01256 766003  
E: sales@fillers.co.uk

**Ishida Europe**  
T: 0121 607 7700  
E: info@ishidaeurope.com

**G Mondini (UK)**  
T: 01785 812512  
E: sales@gmondini.co.uk

**Saturn Spraying Systems**  
T: 01202 891863  
E: sales@saturnspraying.com

**Sewtec Automation**  
T: 01924 494047  
E: sales@sewtec.co.uk

**Waldner UK**  
T: 01722 782625  
E: david.pratt@waldner.co.uk

LIDDING AND SEALING

## Aluminium trays put the pressure on sealing

The choice of packaging materials used for tray-and-topseal ready meals has always depended on a number of factors. The type of heat process and consumer cooking used, the quality of barrier required and the need to heat seal quickly and reliably have always influenced the exact specification of tray and film.

But now, as retailers work at differentiating ready meals ranges, and consumers are asked to be more aware of environmental considerations, quality and 'sustainability' perceptions are also increasingly coming into play.

For example, G Mondini has seen particular growth in demand for smoothwall aluminium in ready meals and wider prepared foods markets. According to sales director Brian Hemsley, this poses particular challenges and speed limitations at the closing stage, since the uncoated aluminium itself offers no sealing surface.

### Running lines faster

"The quality of the seal is very much down to the pressure exerted," says Mr Hemsley. "Because of our strength in this area, we can run these lines faster than anyone else, at speeds of 11 or 12 cycles a minute." This compares with speeds for sealing plastic trays of non-spilling product of 16 or 17 cycles a minute, he explains.

Mondini says the use of servo drives allows the company and its customers to fine-tune sealing lines to the handling needs of each specific application. While outputs can vary from just 20 packs a minute up to 400, most Mondini ready meals lines installed run between 40 and 120 packs a minute.

The popularity of the seven machine models in its Evolution traysealing range has taken off in the last three or four years, claims Mondini, to the point where there are now around 120 machines installed in the UK for different types of food product.

D2 Food Systems and its materials sister company D2 Europack have also responded to increasing industry interest in smoothwall aluminium. In fact, managing director Dave Edwards says that the companies' earlier emphasis on a number of different tray materials has now shifted decisively towards alu-



**Semi-automatic:** Lari 3 sealer from Caveco, Italy, now represented by Record Packaging Systems

minium. "Smoothwall is now associated with higher quality prepared foods, and is a fast-growing market," he says.

He points out that Marks & Spencer and Tesco have both chosen aluminium for new premium ready meals ranges. In fact, in the case of Tesco's new Fresh range, nearly two-thirds of the 18 upmarket recipes in the range are in foil rather than plastics or board.

Since messages about dual-ovenable aluminium are not filtering down to consumers – or even being pushed very hard by brands and retailers – this focus on foil also suggests renewed consumer interest in traditional, rather than microwave, cooking.

Specific premium presentations from D2 include the Smoothdome PET lid, which can be heatsealed to a complementary smoothwall tray on the latest generation of Ulma Scorpius machines. The dome, which rises some 60 or 70mm above the top of the tray, can be used for uncooked whole poultry or joints of meat, says Mr Edwards.

But a snap-on version of the dome has already been used by one retailer for duck pieces in sauce. There is no reason, he says, why versions of the PET lid – which is formed with a heatsealable PE layer on the rim – could not be sealed to the tray to differentiate similar prepared foods in future.

D2 cites the recyclability of aluminium as one of the reasons why retailers are favouring foil over plastics. Others have noted the trend to look for alternatives to those polymers such as cPET which grabbed a large slice of the ready



**Repeat orders:** Katsouris Fresh Foods now has four Packaging Automation Vision 400 tray sealers

meals market during the 1990s. But not all agree that aluminium is the favourite to replace them.

Heat seal specialist Proseal believes that the trend towards using fibre-based packaging for sandwiches and other fast food is also being taken up by the ready meals market.

**RF sealing systems**

But Proseal pinpoints another way in which packaging and sealing preferences for ready meals can affect recyclability and overall environmental performance. Even a monolayer plastics tray needs to be laminated with a heat-seal layer, polyethylene onto a polyester tray, for instance. This means that the tray itself, and even any production waste, is not recyclable, says the company.

Like other tray-sealer companies, Proseal has been exploring radio frequency (RF) sealing as an alternative to heatseal and has been collabo-

seals can both be produced on the same material.

“RF is still relatively new, and further development work will take place in the coming months and years to refine the systems and bring a range of machines to the commercial market,” says Proseal UK director Steve Malone. Even so, Proseal sees RF sitting alongside heatseal as an alternative to – not necessarily a replacement for – the more traditional sealing technology in specific applications.

Adpak has represented Italian tray-sealing specialist Reepack for only a few months, but is already seeing some unexpected benefits. Area sales manager Tony Roberts, who is responsible for Adpak’s food division, says he already has the answer to one customer’s request for a line to seal 120 board/PE trays a minute thanks to Reepack’s German factory, which can offer just such a system. In fact, the Reefast 1000 is able to seal up to 130 trays a minute.



**High speed:** Ishida QX-1100 seals up to 200 trays a minute

Most of Reepack’s tray-sealing business is in more conventional areas, with top speeds of around 18 cycles a minute. On the RK60 machine, speeds go down to 6-8 trays a minute, but Mr Roberts emphasises that the system is still automatic. Other machines in the range include the Reematic, with an output of eight large trays a minute, while for off-line sealing, Adpak has Reepack’s bench-mounted system.

rating with RF applications specialist Stanelco on a sealing system based on this technology. Production waste can be reused, since there is no need for lamination, and weld seals and peel

sealing machine, launched in the UK at last year’s Foodex-Meatex exhibition, is said to be the first machine to offer speeds of 200 packs a minute, while at the same time maximising

flexibility between tray formats. As well as servo control, the line incorporates a new gripper arm design, Ishida's Inside-Cut seal system, and the ability to adjust seal width and 3D profile. Tool handling, and even tool design and manufacture, have been simplified, according to the company.

### Integrated checkweigher

A checkweigher integrated within the machine means that over or underweight packs can be identified prior to sealing, so potentially saving lidding film and cutting tray wastage. For MAP, the gas mix is continually analysed and adjusted where necessary. A 'sleep mode' facility avoids condensation on the tooling, and ensures that the machine is always ready for immediate use after pauses in production.

Record Packaging Systems is now distributing tray-sealing equipment from Italian manufacturer Cavoco, said to be the third largest producer of such machinery in Europe. The range starts with the Lari 3 semi-automatic machine, and is topped by the hydraulically operated Automa and Gamma fully-automatic systems.

All Cavoco systems have the option of vacuum skin packing which, Record argues, greatly enhances the appearance of the product.

Tray-sealing systems available from Erapa UK include the fully automatic GV80 and semi-automatic GV52, both from Vacuum Pump, Italy. The stainless steel GV80, protected to IP65 standards, can be combined with gas flushing, MAP, tray denesting, tray-filling and weighing. Conveyors can be programmed with soft start-stop facilities for spillable products.

Repeat customers for Packaging Automation include Katsouris Fresh Foods in London, specialising in pasta ready meals and cauliflower cheese-type products. The company's two sites now employ four automatic Vision 400 tray sealers each capable of speeds up to 18 cycles a minute and running four impression tools to give outputs up to 72 trays a minute. The system can operate with or without MAP.

For manual tray-sealing, Planet Flowline has recently installed several Tecnovac Olympia S machines, equipped with fully-automatic film wind. These have been supplied for products as diverse as prawns, meat portions and sausages. Tooling can be interchanged with the entry-level Athena machine and both machines can be rented, as well as purchased.

Higher-speed systems from Tecnovac include the Linear 500, with a maximum throughput of

60 a minute. Tooling can be changed over in ten minutes.

Finally, FP Packaging Machinery has recently supplied a snap-on tray lidding unit to a major French ready meals producer. The lids, which incorporate a fork, are applied to film-sealed plastic trays of single-serve pasta at speeds up to 40 a minute although FP says the lidding stage could manage 65 a minute.

Vacuum suction pads lift each lid from an inclined stack, holding it in place until a tray is indexed into position underneath it.

Each tray is stopped at a pneumatically-actuated gate, then released into the lidding area against a second gate. The lid is placed and tamped in a single movement, thanks to a customised plate which surrounds the vacuum grippers.

The reciprocating placer uses a servo drive and an integral and expandable PLC, so that control can extend to gating sequences and guarding. Equally, the servo controls allow size changes to be carried out rapidly.

### For further information:

#### Adpak Machinery Systems

T: 01282 601444

E: [info@adpak.co.uk](mailto:info@adpak.co.uk)

#### D2 Food Systems

T: 01582 622111

E: [sales@d2foodsystems.com](mailto:sales@d2foodsystems.com)

#### Erapa UK

T: 01582 722462

E: [info@erapa.co.uk](mailto:info@erapa.co.uk)

#### FP Packaging Machinery

T: 01483 532811

E: [sales@freezepack.co.uk](mailto:sales@freezepack.co.uk)

#### Ishida Europe

T: 0121 607 7700

E: [info@ishidaeurope.com](mailto:info@ishidaeurope.com)

#### G Mondini (UK)

T: 01785 812512

E: [sales@gmondini.co.uk](mailto:sales@gmondini.co.uk)

#### Packaging Automation

T: 01565 755000

E: [info@pal.co.uk](mailto:info@pal.co.uk)

#### Planet Flowline

T: 01778 341166

E: [info@planetflowline.co.uk](mailto:info@planetflowline.co.uk)

#### Proseal

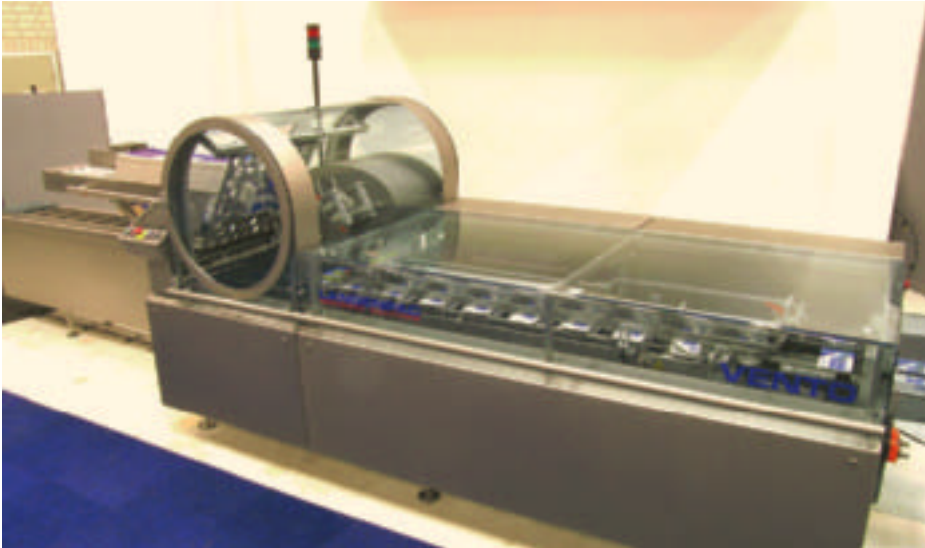
T: 01625 856600

E: [info@prosealuk.com](mailto:info@prosealuk.com)

#### Record Packaging Systems

T: 0161 864 3971

E: [sales@recordpackaging.com](mailto:sales@recordpackaging.com)



**Langenpac Vento:** Fewer parts are said to mean more competitive pricing and easier maintenance

CARTONING AND SLEEVING

## Frozen trays pose challenge for high speed cartoning

**T**rays of product, especially when they are frozen, can be distorted and difficult to handle at high speeds. Preparing them for cartoning can be a particular challenge, and one which Kliklok Woodman helps to address with its Rotary Transfer System (RTS).

The RTS allows trays to be received from upstream equipment narrow edge leading. A combination of software and belt technology helps to position the tray, which then enters the rotary turret where a right-angle turn smoothly sweeps the tray into the infeed conveyor of the cartoner.

Kliklok Woodman cartoners suitable for ready meals are available in speed ranges up to 250 cartons a minute. The smallest machine, the CCI, is a fully-automatic option said to be a cost effective solution for speeds up to 40 a minute. As the company says, this may be suitable for smaller producers, or larger manufacturers needing additional seasonal capacity.

The mid-range SFR cartoner will handle outputs up to 150 a minute, with different infeed options and a servo-driven version.

Represented in the UK by Springvale Equipment, Langenpac has its intermittent-motion Breeze and continuous-motion Vento cartoners, which incorporate servo drives and quick-change features. Breeze machines will run at speeds up to 80 a minute, handling cartons up to 15in pitch while the Vento can handle up to



**Banding trays:** BandAll units from Erapa (UK) can apply bands up to 100mm wide

450 a minute using cartons up to 9in pitch.

Langenpac stainless steel cartoners were recently delivered to two ready meals producers in North America. One of these is a Californian rice-based meal manufacturer which uses the 'billboard' effect of the carton to promote the healthy positioning of its range.

Rather than being dragged along the chain inside the cartoner, the blanks are positively carried along by lugs in the product path. In this case, gable-top tooling helps to differentiate the carton from competitors. The cartoner manages speeds between 80 and 100 a minute, says Springvale.

### Tapered carton

The second installation is for a microwaveable ready meal packed in a tapered carton. Once again, this provides a valuable point of difference for retail, but poses particular challenges at the carton erection stage.

The rice-based contents, packed in a bag, are manually loaded onto the infeed at speeds of 60ppm. Tapered lugs in the product path again

protect the carton graphics by carrying the blank, and also accommodate the tapered sides. The speed challenge was overcome by using a double-pitch indexing belt and angled carton magazine with a dual feeder.

Frank Van Bentum, sales manager at Langenpac in the Netherlands, says: "A key aspect of our new machines is the lower parts count, which is the result of lean engineering and customer interaction." He adds: "Lower parts counts lead to more competitive pricing and easier maintenance."

Kliklok Woodman offers both cartoning and sleeving machinery, but notes that increasing numbers of brands and retailers are switching to sleeves for microwaveable ready meals.

The Certiwrap range of wraparound sleeving machines, which includes the 150-a-minute C150, features quick, three-dimensional size change, allowing changeover times of less than 10 minutes, says the company. These sleeving systems can also accommodate tray 'doming', where the film lid expands in production.

D2 Food Systems is now supplying the Sure-sleeve machine for pre-glued sleeves. Designed by Italian sleeving and cartoning specialist Rama, the system takes up 1.5 metres of line length and will apply anything from full-length sleeves to watchstraps at speeds up to 60 a minute.

Typically, smaller ready meals operations are still sleeving by hand, employing two or three staff to keep up with a 40 or 50 a minute production line, points out D2 managing director Dave Edwards. So payback through automation can be relatively fast. Crucially, though, if there is a problem at the sleeving stage, the use of pre-glued blanks means that they can be applied by hand, if necessary.

Landor Cartons reports it has recently sold two new designs from the Vimco range of sleeving equipment. The Italian company's machines are built in stainless steel as standard, with either an in-line or tangential infeed, as required. One of the two models has the capability to switch quickly between round and rectangular trays, says Landor.

Maximum machine speeds are 80 and 150 trays a minute. Material overlap is said to be minimised at the hotmelt gluing station, with the option of a pre-gluing module to bond the sleeve to the tray and so help prevent in-store tampering.

As an alternative to sleeving, banding has distinct material-saving advantages. Erapa UK, which supplies BandAll band applicators,

points out that pre-glued board sleeves have to be made to a fixed maximum size to compensate for manufacturing tolerances. Bands, on the other hand, are applied with the same tension around each pack. One reel can hold 2000 individual bands.

Paper or plastic bands can be supplied 29, 48, 75 and 100mm wide, in anything from full-colour designs to simpler decoration. Applicators can include overprinters for variable information such as barcodes and best before dates. Erapa points out that the same system can contribute to shelf-ready packaging (SRP) solutions, holding a collation together until it is lifted on-shelf, at which point the band can be easily removed.

### For further information:

**D2 Food Systems**  
T: 01582 622111  
E: sales@d2foodsystems.com

**Erapa UK**  
T: 01582 722462  
E: info@erapa.co.uk

**Kliklok Woodman International**  
T: 01275 836131  
E: m.tatum@kliklok-woodman-int.com

**Landor Cartons**  
T: 0121 359 8511  
E: packagingsystems@landorcartons.co.uk

**Springvale Equipment**  
T: 01420 542505  
E: springvale@springequip.co.uk

END-OF-LINE

## Wraparound case packing suits multipacked pots

**C**ama Group installed equipment for both electronic sleeving and wraparound case-packing, both at high speeds, at a French customer last year.

In this installation, small cups containing sweetcorn are put into board sleeves in either single or twin-layer formats at speeds up to 200 cups a minute. The multipacks are then collated in a pocket conveyor before being transferred using a two-axis robot for wraparound case-packing at speeds of 13-26 cases a minute.

The combined operation has a relatively compact footprint, says Cama, and offers good access for the operator.

Small cups of this sort are used internationally for a number of different food applications. The availability of high-barrier plastics versions means that microwaveable snack pots containing products such as fish and vegetables can now be sealed and sold as ambient, long-life foods.

For end-of-line operations which are otherwise manual, Endoline has its 100 series of case-formers. The machine folds the lower flaps, then holds the case open and steady to allow packing to take place. The simple operation has few moving parts, says Endoline, and requires no adjustment when moving from one case size to another.



**Wraparound case-packing:** Cama machine handles multipacked pots at 13-26 cases a minute

The company's 200 series of fully automatic erecting machines can handle cases for transit and trays with hinged lids and other display features. Finally, the 310 series of pick-and-place machines provides fully automated loading of cases and trays, and is particularly suitable for companies moving away from repetitive manual handling operations.

**Twin level packing station**

One ready meals producer has installed Endoline's twin-level hand-packing stations on three manual sleeving lines. Here, pack consumables are held on one level, and product on the other. Endoline 200 case erectors were installed on three higher-speed lines running automatic sleeveers at speeds of 60 packs a minute.

Another manufacturer took delivery of Endoline's type 221 case erector, designed to handle smaller, shelf-ready units at higher speeds. Case erecting speeds rose from 12 to 20 a minute, says the supplier.

As well as providing end-of-line systems based on Fanuc robots, Pacepacker Services also builds its own multi-axis servo system designed specifically for packing into retail crates and boxes, at speeds up to 120 packs a minute. Using vision systems, the equipment can also identify a variety of pack characteristics in preparation for picking or palletising, such as colour, size, product, weight and even orientation.

Crate de-nesters are also available, with the standard unit holding 20 crates and storage for 40 more.

**For further information:**

**Cama3**  
T: 01793 831111  
E: cama3@camagroup.com

**Endoline**  
T: 01767 316422  
E: sales@endoline.co.uk

**Pacepacker Services**  
T: 01371 811544  
E: mail@pacepackerservices.com

**Machinery Finder:**  
**PPMA.CO.UK**  
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QUALITY CONTROL AND TRACEABILITY

**Costs fall for X-ray inspection**

The bulk of small-to-medium size ready meal producers are still likely to have just the minimum requirement of metal detection on their lines says Darren Eaton, product inspection service manager at Thermo Scientific. X-ray inspection remains very much the preserve of the larger operations.

This is despite much greater competition in the X-ray market, and a gradual erosion of equipment prices. Mr Eaton notes that the first generation of what is now Thermo Scientific's Goring Kerr range had a price tag of around £120,000 some 10 or 15 years ago. A similar mid-range machine now might be priced at £30,000-£40,000, he says, depending on the reject mechanism.

The PROx, introduced in mid-2006, is the fifth generation of Goring Kerr X-ray equipment. Its key distinguishing feature, according to the company, is that it offers greater competition on cost since improved manufacturing costs have allowed prices to be reduced by up to 10 per cent compared with the previous range.

Thermo Scientific says it now offers a complete range of X-ray systems. Entry-level equipment includes the EZx, introduced just over a year ago, and offering basic contaminant detection. In fact, says the company, it can be seen as an alternative to ferrous-in-foil metal detection.

At the top end of the market, the company now offers a range of equipment from Italian specialist Dylog. Here, applications requiring higher processing power would typically include glass-in-glass detection.

In the UK especially, with retailer own-label dominating the chilled ready meals market, product protection goes hand-in-hand with brand protection when it comes to quality control. "Suppliers to the more upmarket chains such as Marks & Spencer are put under some pressure to use X-ray, if possible," says Mr Eaton. "People are afraid of the press coverage with any contamination scare."

Bone is one of the leading contaminant risks for meat-based meals, he points out. "In fact, virtually every UK poultry supplier has X-ray equipment, and where a meat supplier does not have a suitable system in place, meal manufacturers will be pushing them to install one."



**Non-invasive:** Celsius microwave thermometry system from Loma can reduce freezer costs

Nonetheless, fluctuating ingredient prices and continued pressure on retail pricing will sometimes leave makers of meat-based meals with little option but to use cheaper sources of supply. Where a given ingredients shipment is seen to pose a particular risk (pieces of stone in vegetables is another potential hazard), or line components such as rubber washers are thought to have contaminated a specific product batch, says Mr Eaton, customers can use Thermo Scientific's product inspection service.

**Try before you buy**

This service allows manufacturers either to ship a batch of product to Thermo Scientific's site for high-sensitivity X-ray inspection, or to install equipment temporarily at their own site. Mr Eaton is the first to admit that, although this can act as a one-off service to address specific problems, it also has a "try before you buy" function. "It does sometimes help to persuade manufacturers that they need their own in-house X-ray systems," he says.

Another, very different, element in quality control which is of vital importance to the chilled meals market in particular is temperature monitoring. Loma Scientific says its Celsius microwave thermometry system can deliver real savings to companies, and offers substantial benefits compared with alternative systems.

Traditional methods of temperature measurement include thermocouple probes and infra-red systems, Loma points out, but both have their limitations. Probes can be easily broken, cause product wastage and are generally only accurate to ± 1.5deg C, it maintains. Infra-red is unable to take readings beyond the product surface.

Microwave thermometry is non-invasive, and

takes an equilibrium temperature, rather than one from the outside or middle of the product. Because the system is accurate and consistent, says the company, manufacturers no longer have to overcompensate with lower settings on their chillers and freezers.

According to Loma, one ready meal producer is taking off-line temperature readings every 30 minutes, and is using the Celsius system to make savings of over £40,000 a year. It is also useful for the frozen sector, where one producer has been able to run its freezer 4deg C higher.

Auto ID systems integrator Cobalt IS explains that the growing tendency to pack multiple short-run products on a single line makes the validation and verification of codes and labels an especially important aspect of ready meals quality control. The use of Cobalt Sentinel means that the entire process is controlled from a single point, says the company.

Biometrically-approved access at the beginning of a product run allows the operator to identify a specific item. Set-up parameters are automatically sent to the ink jet coders, validation systems and print-apply labellers for primary and outer packaging. This avoids the risk of inconsistencies and errors where individual

pieces of equipment need to be reset manually.

Every pack is checked to ensure that all data is correct for the batch, and any product is rejected without interrupting the flow of production.

When dealing with all types of food and pharmaceutical supplier, coding and labelling specialists increasingly need to offer comprehensive systems for product traceability. Although radio frequency (RFID) tagging receives the most attention, says Codeway sales manager Barry Day, traditional and 2D barcoding can also hold huge amounts of supply chain data. And they can do it for individual items.

### Extra data with 2D codes

"You can apply a secondary code with time and date of production and batch data, and that won't incur extra costs," he points out. "I promote 2D codes such as Datamatrix, because they can compress a lot of data and still use standard GS1 identifiers."

Some manufacturers prefer to use standard bar codes, even for internal and traceability data. Mr Day points to the example of Pukka Pies in Leicester which uses the EAN 128 symbology on individual cartons.

Machine-readability is key, he says. While price barcodes are the only instore codes that are currently machine-readable, retailers are keen to have similarly scannable codes for key data such as best before dates, he says. For this reason, debate is now focusing on whether Reduced Space Symbology (RSS) should be used to encapsulate this type of data. ■

### For further information:

#### Cobalt IS

T: 01606 42500

E: sales@cobaltis.co.uk

#### Codeway

T: 01206 751300

E: identify@codeway.com

#### Loma Scientific

T: 01252 893300

E: sales@loma-cintex.com

#### Thermo Scientific

T: 01788 820300

E: sales.wi.uk@thermo.com

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