

# SNACKFOOD

EXTRUSION

## Flexibility required for short term products

As supermarket own labels take a more dominant role in the snacks market the pressure for greater differentiation and constant new product development grows stronger.

The scope to alter shape as well as flavour or base ingredient means that extruded snacks are a prime target for new product development. But few major new brands on the scale of KP Foods' Skips or Walkers' Quavers are appearing. Instead, the emphasis is on relatively short-term special shapes and flavours – stars and Christmas trees for the festive season, for example, or football shapes during the World Cup – under supermarket labels.

So manufacturers serving this market are looking for flexibility above all else, and will be reluctant to invest heavily in equipment that can only produce a few product variants.

Flavour variation is relatively easy to achieve. But product development in extrusion is primarily about shape or ingredients, and these are problems that manufacturers often push back upstream to their ingredient suppliers.

Many finished product companies do not, of course, extrude their own doughs at all, but buy in half-finished wheat, corn or potato-based pellets from specialist European suppliers such as Italy's Valin and Mafin, Spain's Leng D'Or, Britain's Pasta Foods or the USA's General Foods.

Pellets are supplied in bulk and then expanded by the manufacturer, using either hot air ovens, fryers or, in some cases, microwaves, prior to seasoning, flavouring and bagging.

However, pellet producers are beginning to feel themselves threatened as some finished-goods producers invest in 'direct extrusion', cutting out the upstream pellet maker, in a bid to trim a few more pence from their costs.

Generally, this has only happened among high-volume snacks producers in the commodity market. But, if the price is right, direct extrusion can provide smaller manufacturers with a way to

diversify and to make better use of oven or fryer time.

For example, US firm Reading Bakery Systems (RBS) has been encouraging its clients to take a second look at old-fashioned low pressure extrusion technology whereby twin screws force dough through a series of dies, in a relatively straightforward operation, at about 150psi.

Low-tech means relatively low cost and low maintenance. And it means that manufacturers of other types of snacks who have ovens sitting unused for part of the week can consider diversifying into extruded products without too much heartache. "So many companies who have oven time available are trying to figure out 'how do I fully utilise my investment?'" says an RBS spokesman.

### Second low-pressure extruder

RBS, which is represented in the UK through Heat & Control, has recently installed a second low-pressure extruder at a small UK snack producer to enable it to move into products such as corn rings and mini bread sticks.

The ability to replicate Hula Hoop-style potato rings on the RBS set-up is considered a significant breakthrough. Traditionally, these would be produced using a reciprocating piston to extrude short bursts of dough, with the result that a lot of short pieces are produced at the end of each stroke. A low-pressure system, however, is continuous as long as there is dough in the hopper that feeds it, which takes away the worry of how to deal with all those short pieces.

RBS says low-pressure is a popular retro-fit to existing snacks lines and "a low-cost way to put front-end forming in". Although dies can be custom-designed by RBS on its CAD system, there are "literally thousands" of existing ones to choose from, which means that the majority of shapes a snack manufacturer might want are probably already available off the shelf.

Another option available from RBS is co-extrusion, either to combine two different doughs in one product or to add a filling such as jam. Co-extrusion has really taken off in the last few years, typically in the form of pillow-shaped breakfast cereals or cheese-filled straws. Downstream, many of these products are also given further added-value by the addition of glazes, flavours or chocolate coatings.

"Filled products are growing in popularity in an increasingly sophisticated marketplace," says a spokesman for APV Baker, which has pioneered new co-extrusion techniques. "Snack producers planning to add them to their range merely need to retrofit a new die and a suitable auxiliary pumping system to an existing extrusion installation."

### Bolt-on co-extrusion

Another example of the low-cost retro-fit comes from US firm American Extrusion International. It has developed its own co-extrusion system – dubbed the Pillow Cutter – as a bolt-on to its established single-screw extruder.

The Pillow Cutter is designed to create a pillow from extruded grain which can either be left



Simple concept: ABT twin screw extruder from Planet Flowline for expanded snack food lines

# REPORT

Mick Whitworth reviews equipment for snackfood production\*



**Half as much again:** Output of filled snacks can be raised 50 per cent with APV Baker's six-stream die

hollow to create a light, crunchy textured snack, or given a sweet or savoury filling. Standard rollers can create triangles, squares or bars, and there is an optional diamond shape as well.

APV Baker has taken co-extrusion even further with the development of a triple-extrusion system, which allows the addition of a second filling, for example, a combination of cream and paste, or perhaps to add air into a cereal tube.

Indeed, APV claims output of filled extruded snacks can now be improved by 50 per cent following its introduction of six-stream dies for both co- and triple-extruded snacks. Its range of SB twin-screw extruders previously handled a maximum of four streams, and APV says the uprating to six demonstrates the 'robust power' of the latest generation of solid barrel extruders.

A new cutting/crimping machine has also been launched to handle a higher extruder output. Capable of handling eight lanes of product, this can operate either as a crimper – making only a partial cut, to maintain a continuous stream of product for downstream operations such as cooling – or as a cutter for products which are to be packed immediately.

One company that has worked closely with APV Baker on snacks line development is Planet Flowline. Based, like APV Baker, in Peterborough, it has been designing, installing and

commissioning complete snack food processing lines for many years. The hardware it supplies includes extruders, dryers, cutters and flavour systems.

According to Planet Flowline's Ian Carter, a typical expanded snack food line supplied by the company would begin with an ABT twin screw extruder. This model, he says, is "designed around a simple concept but based on proven principles of co-rotating, fully intermeshing, self-wiping screw technology".

A robust gearbox is used, together with a powerful, high-speed motor, with a solid barrel fitted with a bi-metallic lining on a stainless steel substrate.

### Triple pass action

From the extruder, product will typically pass through a three-pass dryer, equipment which has "dramatically improved" lately, according to Ian Carter. The triple pass action offers close control of moisture content, and improved air flows help keep running costs down, while full-length doors all round give good access for cleaning.

Standalone post-extruder cutters are then available to create products such as chipsticks and bacon bites, with multi-stream cutters giving throughputs in excess of 1000kg an hour.

Finally, Planet Flowline can supply complete flavour systems, including tumble drums, flavour holding vessels, pumping units and cooling conveyors, along with all the necessary inter-connecting conveyors and elevators to complete the line.

The company represents a number of equipment suppliers, including APV Baker, and recently supplied APV with an entire expanded snacks line based around one of its own extrusion systems.

The line comprised a chipstick cutter, elevators and spreaders at either end of a Model 500 triple-pass dryer, a flavour system, and a forced ambient air cooling conveyor for finished product. The system, capable of handling around 450kg of expanded products an hour, was destined for a snack manufacturer in Tehran.

### FOR FURTHER INFORMATION:

APV Baker	enter 182
American Extrusion	enter 183
Heat & Control	enter 184
Planet Flowline	enter 185

\*except bagging, which was covered last issue

### CASE STUDY: UNION SNACKS

## Pretzel lines represent a 'Big ticket business'

**M**aking pretzels is as different from making crisps or tortilla chips as it is from bottling a pint of milk, according to Calum Ryder, operations director of Union Snacks. That's why he went to the US, the home of the pretzel, to find out how to put together the company's first production line, commissioned six years ago.

Some of the equipment – such as the Peerless dough mixers, Ishida NZ Compact multihead weighers and Sandiacre baggers – would be common to many food environments.

But the main processing sections of both Union's baked snack lines, which take dough from extrusion through to kiln-drying, were supplied on a turnkey basis by US pretzel specialist Reading Bakery Systems.

### Second line installed in 2001

The first line was installed in September 1996, shortly after Union Snacks was set up in Stanley, Co Durham, by Calum Ryder and two other former Derwent Valley Foods executives. A second line – also supplied, if not entirely manufactured, by RBS – was installed in 2001. Calum Ryder reckons the kit is currently unique within the UK.

"Getting into pretzels is a big-ticket business," he says. "To do the job properly you're looking at £2 million to get into production."

Despite the size of the investment, the pretzel manufacturing process appears relatively simple, although looks can be deceptive says Mr Ryder.

A dough, comprising little more than oil, wheat flour, water, yeast and dextrose, is extruded through a die plate onto a conveyor. The rows of dough pass under a guillotine that cuts the individual pretzel shapes at speeds approaching 7000 pieces a minute on line one, and nearer 9000 on line two.

The newer line also features an improved, eccentric-motion cutter that pushes each slice of dough away from the rest. This means Union can

use a stickier dough, enabling it to produce new products that require more moisture.

After moving along a variable-speed proofer-conveyor, the pieces are dipped through a weak solution of food-grade sodium hydroxide. This brings out the starches in the dough and gelatinises the surface, helping create the characteristic shiny surface of the pretzel when it is baked. The product is conveyed under a salter, then enters the main cooking phase.

**Biggest oven ever**

When Union had its first cooker installed it was the biggest convection oven ever sold by RBS for pretzel manufacture. “We didn’t set out to have a massive line,” says Mr Ryder, “but it has to be a certain size to make economic sense.”

The cooking process is a combination of baking and drying, and takes about an hour. The upper chamber of the cooker is a convection oven, operating at around 320deg C. Pretzels are baked for around 15 minutes as they are conveyed through this section.

They then emerge at one end of the unit to slide down a chute onto the drying conveyor that loops back through a second, lower chamber. Here the product is kiln-dried by air, blown more forcefully through the chamber, but at lower temperature.

“If we continued baking at 320deg C we would end up with burned pretzels,” explains Calum Ryder, “so we just use the top oven to set the structure of the product, then finish them off in the kiln.”

The newer oven on line two has the additional flexibility of radiant heat, with ten radiant burners in addition to the convectors, and also features a naked flame burner that heats the belt before it picks up incoming product, which gets the pretzels cooking more quickly.

“Convection is generally thought to give better consistency,” says Mr Ryder, “but radiant heat is more penetrative and gives us more flexibility in key product attributes such as texture and appearance.”

It has also helped give Union Snacks the flexibility to produce a wider range of products, notably breadsticks, which may require different process combinations.

The operator interface on line two is an Allen Bradley Panel View as opposed to the manual



**Big ticket business:** Pretzel production means you’re looking at £2 million to get into production says Union Snacks operations director Calum Ryder (left)

system on line one. Both lines are controlled by SLC 504 PLC systems and programming of these is carried out in house.

Line two’s menu-based operating system currently

holds 10 line formulas, but with Union currently producing up to 60 line variants it now plans to reprogram the system to give more pre-set options.

Calum Ryder says he remains slightly wary of fully-programmable operation in what is still partly a craft business. “You really want the operators to know why they are doing things, not just to say ‘I’m making bread sticks so I’ll press button 9’. It’s more efficient, but it’s got to be backed up by appropriate training, so that if there’s an issue they know how to react.

“So technology is good and valuable, but it does come with a health warning.”

**Salted products dominate**

Key parameters include extrusion pressure, proofing time and temperature, strength of the sodium hydroxide dip, and moisture content of the product as it passes through the oven and kiln.

Despite the enthusiasm of taste panels for flavoured pretzels, Calum Ryder says sales are dominated by straightforward salted products.

Those that do need flavouring are conveyed to a new flavouring drum.

Flavoured or otherwise, finished product is conveyed directly to the Sandiacre vertical form-fill-seal machines via 14-head Ishida weighers.

**Bagger for airline packs**

“We bought a Sandiacre bag-maker specifically to handle airline packs,” says Mr Ryder. “It can do 130 bags a minute without too much trouble, and we run it 100 hours a week producing nearly all our airline products.”

Union Snacks supplies three main markets: multiple retailers, airline snacking and bulk ingredients to the industrial market. It’s a niche business, focused on quality and flexibility rather than volume. This puts limits on the degree of automation it can sensibly introduce.

So, for example, case packing remains largely manual and, at the start of the process, dough is moved manually to the hoppers that feed each extruder. “That’s just a cost we have to bear,” says Ryder. “You can’t build your business on flexibility and then not be flexible.”

**FOR FURTHER INFORMATION:**

Ishida Europe	enter 186
Peerless	enter 187
RBS [Heat & Control]	enter 188
Sandiacre Packaging Machinery	enter 189

CASE STUDY: RED MILL SNACK FOODS

# Peristaltics now meter flavours accurately

**R**ed Mill Snack Foods has adopted peristaltic pumps from Watson-Marlow Bredel to meter flavourings, avoiding corrosion problems with lobe pumps and achieving accuracy to  $\pm 0.5$  per cent, as well as easier cleaning.

First brought into service more than a decade ago, the pumps now handle some 30 different flavourings used in Red Mill's range of extruded maize snacks produced in its factory at Wednesbury, West Midlands.



**Metering flavours:** Watson-Marlow Bredel peristaltic pumps have been adopted by Red Mill

"The low shear pumping action and the ability to enclose the pumped media, a slurry, completely within the tube, allied to the absence of vanes, valves, diaphragms, impellers, seals and low velocity areas, ensures optimum levels of hygiene and product integrity," says Watson-Marlow Bredel.

"The ability to sustain volumetric accuracy, irrespective of changes in viscosity of the slurry, ensures that consistent dosage of the flavouring required by the recipe is maintained at all times."

Prior to the switch to peristaltic pumps, the

job was carried out using stainless steel lobe pumps, but corrosion was a problem due to the high salt content of some flavourings. This led to excessive downtime and spares consumption, with the additional risk of product contamination by eroded metal particles.

The powdered flavourings are blended with oil in a mixing kettle to produce the slurry, which is pumped to spray nozzles through 0.5in pipework and a venturi system. Pump speed, and hence output, is adjusted manually in accordance with the number of extruders in service and the flavouring required.

## Higher flow rate pumps

Originally Watson-Marlow 600 series single channel pumps were used for this application, but recently higher flow 700 series twin channel pumps have been introduced. Flow rates range from 1.6 to 33 litres/min.

At the end of a shift, or when flavourings are changed, the pumps are reversed to scavenge the lines and return residual product to the mixing kettles, so saving waste.

In all, there are ten pumps currently in service, fitted with USDA standard Marprene and abrasive resistant Neoprene tubing.

**More information - enter I90**

## SORTING

# Second sweep keeps waste to the bare minimum

**G**reen potatoes, stray pieces of skin and near-black over-fried pieces are typical of the particular quality hazards facing crisp manufacturers.

Visual inspection of some kind is a must, and with the human eye only reckoned to be good for 400 'looks' without taking a break it's not surprising that electronic optical sorting has been widely adopted.

Indeed, with better inspection has come a general increase in quality, the downside of which is a growing intolerance among consumers to 'black bits' and 'green bits' of any description whatsoever.

The way round this with older colour sorters has simply been to increase their sensitivity. This is fine, but it can result in an excessive volume of



**Finding defects:** Radix systems sort by colour and shape to find burnt or broken pieces

good product being discarded along with the bad. Even some major producers confess to keeping the sorters turned off when producing for value brands.

There are also issues of space. On a large-scale crisp line as much as 4-6 metres of conveyor length may be required to accelerate crisps prior to inspection and rejection.

However, Radix Systems claims to have addressed this footprint problem with its Autosort AS322 sorter, which uses a chute to separate product for efficient sorting. The AS322 offers "lower investment, running and maintenance costs as well as significant saving in the space required," says Radix.

The supplier, which is based in Romsey, Hants, has recently installed its new 'slimline' Autosort at Walkers Snack Foods to remove colour defects from one of its speciality extruded snacks, where only 1.4 metres of line was available between the post-fryer de-oiling conveyor and the further process.

The 1200mm inspection width Autosort installed by Walkers included a re-sort facility, giving a second sweep of rejected material to minimise unnecessary wastage. Using re-claim enables the sorter to work at high capacity, says Radix and, as defects are often broken, the resorting process is a chance for the good part to be accepted and the defect removed, improving overall yield.

## Traditional colour sorting

Radix has been making optical inspection and sorting machines since 1988. It applies its technology to three areas of snack manufacturing of which traditional colour sorting of crisps is only one.

A second application is for potato flakes, often

used by finished product manufacturers as a snacks ingredient. According to Radix, processors in the UK, Benelux, Germany and France are using the Autosort system to achieve A grade product where raw material and process conditions would normally allow B grade or lower.

Two years ago Radix unveiled a new sorter, the AS322A, specifically designed for lightweight products like potato flakes. Features of this compact unit include air-assisted product delivery, a twin-nozzle ejector arrangement and enclosed, dust-free construction.

High resolution cameras are said to ensure defects as small as 1mm are seen in flows up to 1500kg an hour. And as many as 20,000 defects a minute can be removed effectively with "a minimum" of good materials rejected, says Radix.

Finally, with more snacks being packed in tubes, it has become more critical that products fall within tight size margins as well as being clear of colour defects.

This size problem is one that the biscuit industry has faced over many years, so several snack producers have now adopted the Radix 'biscuit' Autosort to remove shape and colour defects.

#### Dimensional check

"Traditional colour sorting needs to be supplemented by a full dimensional check," says a Radix spokesman. "And in some cases – especially formed snacks – it's also necessary to check for folds, doubles or incorrect form.

"When a defect is detected it has to be cleanly removed without affecting the position of the adjacent pieces, otherwise they wouldn't stack and pack correctly."

**More information - enter I91**



**Sorting lightweight products:** Radix AS322 machine occupies only 1400mm of line space

#### CONVEYING

## Automation in multipacking and product accumulation

**A**lthough demand for multipacks of crisps in the UK has tended to increase the number of bagging/weighing machine combinations now equipped with on-machine flavouring – to avoid the costs of stockpiling each of the different product flavours before a multipack run – the labour cost of feeding the right mix of primary packs has also needed to be addressed.

For many smaller producers, the answer remains with manual systems in which bags of different flavour crisps are loaded from a row of bins onto a bucket conveyor – one operator per bin – and elevated into a bagger.

However, in the experience of snackfood packaging specialist Wright Machinery, the trend with larger producers is towards fully automated systems.

"There is no doubt that manual systems suit certain size operations and, since the bags are handled by an operator, there is inbuilt quality control over burst or poorly sealed bags," points out Roger Treacher, sales director at Wright Machinery.

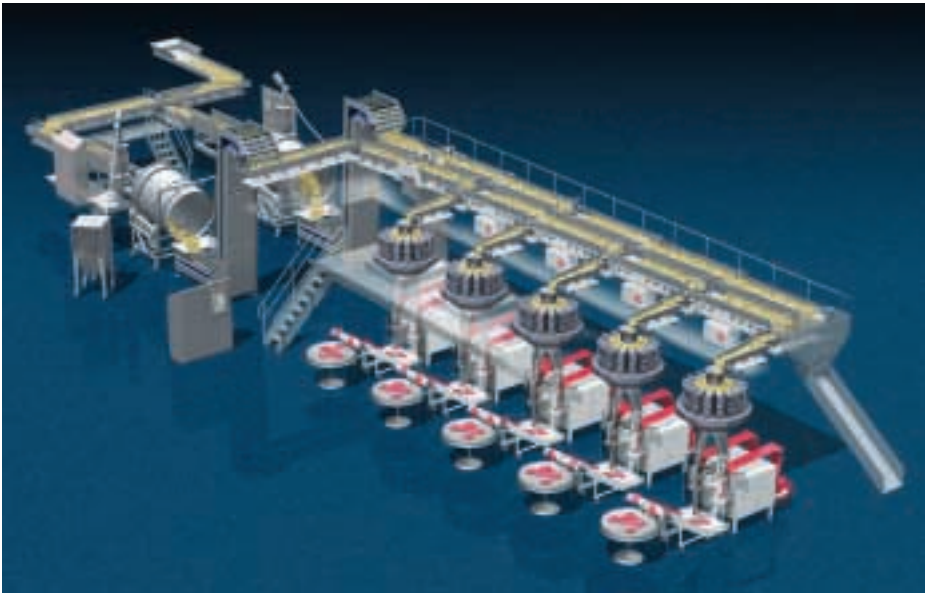
"However, the larger producers have increasingly turned to fully automatic systems, with no labour involvement whatsoever."

Typical of the installations now being built by Wright Machinery is a recent multipacking system for up to six different flavours. Inclined three-sided accumulation bins, each with an out-feed conveyor belt built into its base, are fed by conveyors from the primary bagging machines and in turn feed into a 24 head multihead weigher.

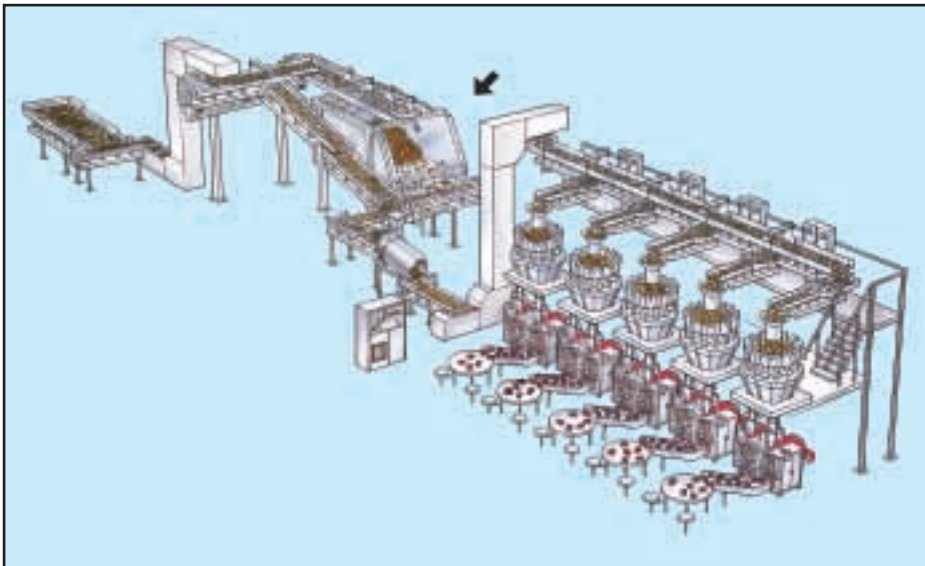
The bins are equipped with 'finger' discharge, to prevent product pieces and broken bags moving any further into the system.

The multihead weigher's hoppers are split into six segments allowing a maximum of 4 x 6 flavours on each drop into the bagger. Speed is up to 60 multipack bags a minute, depending on the primary bag size, while the correct count is monitored via a checkweigher.

The bins in the multipacking system are, of course, sized to take account of anticipated



**Accumulation methods:** Above: Wright Machinery's latest accumulation systems rely on wider and deeper trays for the vibratory conveyors, rather than the previous deep storage vessel (arrowed below)



downtime required on the primary baggers, such as reel changing.

Equally, at the other end of the production line, accumulation systems are required between the fryer and the flavouring and bagging system, although the quest for higher quality has now ushered in new methods.

"The two key quality issues with accumulation arrangements are residence time in the system – with the potential for take up of moisture from the atmosphere – and drop height into a storage system, with risk of damage," explains Roger Treacher.

Traditionally, accumulation has been provided by fairly deep transfer and storage conveyor systems in which the first products to be diverted may need to drop considerably further than usually thought acceptable within the weighing and bagging machines. Otherwise the system occupies too much floorspace.

Then, because the accumulated product can only be taken up by the baggers once they

exceed the efficiency level that matches the process equipment, residence time in the system may well allow moisture to be picked up and reduce product quality.

The solution from Wright Machinery, now adopted by all the larger crisp producers, has been to build the accumulation required into the product distribution system that feeds the baggers.

By using wider and deeper trays for the vibratory conveyors, and then modulating the amplitude, the latest Flostore systems are able to vary the depth of product on the conveyor, so coping automatically with reduced bagging capacity or a surge. Product quality benefits from reduced handling and a more direct product path, reducing exposure to the atmosphere.

In fact, because the conveyors are merely increased in size, capital cost is also lower than the storage systems used before and the floor space required also reduced.

**More information - enter I92**

## INSPECTION

# Line space points to the type of metal detector

**M**etal detection at critical points in the production process is a must-have, but line space is an important consideration. Early detection of contamination is often seen as preferable, so that any waste applies to lower-value ingredients rather than finished, packaged snacks. But the limited space available on many snacks lines means this has not always been an option.

So equipment suppliers such as Lock have worked to address this issue with slimline units capable of integration into high-speed packaging systems.

For example, Lock's MET 30+ Waferthin range of compact metal detectors can be installed in-line between the weigher and vertical bagger, making it suitable for free-falling products such as crisps, nuts and other snacks.

The unit incorporates the latest MET 30+ detector, a system capable of detecting ferrous, non-ferrous and 300 series stainless steel contaminants.

Thanks to a high-speed 32 bit processor, signals from the detector can be interrogated at 60,000 events a minute offering, says Lock, a high level of accuracy. Also, automatically 'tuning out' bagger vibration and external noise interference is said to eliminate false rejects completely.

Most snack firms will use multihead weighers to portion crisps which are then dropped into the bagger. Lock's detectors are typically installed below the weigher and above the bagger so, in the event of contamination, sealing can be stopped and a double-weight packet produced containing the offending product.

Most producers will also then deploy a detector at the end of the line to double-check packets prior to despatch. But the trend towards packaging snacks in metallised film can affect the metal detector's reliability.

Manufacturers have responded by developing software that automatically detects the use of metallised film and switches to a higher level of sensitivity to spot metal within the packaging, a feature included in the MET 30+ unit.

The detector's software also includes user-



**Throat detector:** Lock's new Waferthin model is 25 per cent smaller than previous units

friendly features such as automatic product compensation, which records the profile of conductive products and automatically tunes the detector to spot the presence of metal contaminants.

However, some manufacturers prefer to check their products after bagging, at the last moment before case-packing.

For example, pork scratchings producer Whit Products, Tipton, has installed an EMS 217/ESE 35:15 metal detector from Metal Detection, which also supplied an inclined belt conveyor to accept the packs directly from the bagger.

The microprocessor based electronics in the detector allow the optimum sensitivity to be achieved by automatically phasing out any product effect that may be present. Output relays from the metal detector enable Whit Products to stop the operation of the bagging machine immediately on detection of any metal contamination and remove the contaminated bag from the metal detector conveyor.

**FOR FURTHER INFORMATION:**

<b>Lock Inspection Systems</b>	<b>enter 193</b>
<b>Metal Detection</b>	<b>enter 194</b>



**Straight from the bagger:** Metal Detection installation at Whit Products in Tipton

CODING AND LABELLING

# Transfer printers now offer extra features

Visitors to Interpack earlier this year may have caught a glimpse of two improved thermal transfer coding units aimed particularly at the bagged snacks market by manufacturer Markem Systems.

While the original SmartDate 3c coder was designed to meet the high speed bagging requirements of snacks producers, the new Plus models are said to add further functionality to this series.

Features of the SmartDate 3i Plus and 3c Plus include more processing power for faster imaging, an expanded database memory, portable data transport and more flexibility when it comes to integrating with other systems.

They are also said to offer easy fault-finding by the operator, remote diagnostics, production data-logging features and flexible operation.

According to Simon Chidgey, Markem's general manager for the UK, the SmartDate family now has models to cover "virtually all operations". Between them, they can print large areas of text and ingredient information at a variety of speeds.

**Easier way to control**

Both the new models also feature another Markem development previewed at Interpack. The SmartTouch graphical user interface is said to provide a faster and easier way to control coding operations. Its touch-screen controls allow users to program, design and back-up different label contents both on- and off-line, with the changes being viewed through a colour Wysiwyg display.

Markem says SmartTouch offers companies an easy-to-use interface that reduces the training and technical documentation needed to operate the coder.

Users can also network multiple Markem printers without the use of a PC and also monitor the status of all on-line printers, since SmartTouch is housed in a hand-held, portable device.

"Once a user knows how to run SmartTouch on one machine, he or she can run them all," says Simon Chidgey. "This cuts down on training



**Portable interface:** Markem's new SmartTouch user interface is hand held



**Sushi labelling:** Twin head machine from Graham Labelling handles extra long labels

time and allows supervisors more flexibility with their personnel."

Meanwhile Graham Labelling Systems has supplied Solway Foods, Worksop, with a Commander twin head pressure-sensitive labeller to handle three sizes of Sushi pack produced for Tesco. The top labeller on this machine is fitted with a specially developed wide head to cater for the extra long labels which, on the largest pack, measure 390 x 40mm.

After filling by hand, the packs enter the labelling machine which first fixes the middle of the label to the top of the pack. The packs then enter a top hold assembly where pneumatically operated twin side wipedown brushes apply the label to the sides of the pack.

The packs are then lifted off the conveyor using twin side drive belts and transferred to a further twin wipedown assembly which wraps the label partly under the base of the pack, providing a tamper evident feature. Finally, the main base label is applied before the packs leave the machine.

**FOR FURTHER INFORMATION:**

<b>Graham Labelling Systems</b>	<b>enter 195</b>
<b>Markem Systems</b>	<b>enter 196</b>

## CASE PACKING

# Three-stage solution to end-of-line automation

**H**igh speeds, restricted space, 24-hour production and – frankly – poor quality packaging materials are attributes that suppliers of automated case-packing, taping and labelling kit have become all too familiar with when trying to satisfy the snacks industry.

British manufacturer Endline claims to have taken all these into account when it first started serving snacks and potato crisps makers more than 20 years ago.

Operations director Tony Hacker says the company soon realised it would need to develop new concepts if it was to handle this tough environment with the kind of efficiencies that customers were demanding.

Its first success came with a high speed, fully automatic case-taping machine that could self-adjust to a random selection of case sizes before closing and sealing each case with self-adhesive tape. This 700 series, which could close and seal up to 15 cases a minute, is still selling well today particularly, says Tony Hacker, where there is insufficient space for individual case sealers on each line.

## Key design features

In the mid-1980s Endline introduced its 200 series of case erectors, trumpeting three key design features: a compact footprint, clear access and, most significantly, the 'dual opposing vacuum' system in which cases are opened positively from opposing sides. This design element was said to have overcome a string of commonly-found problems in snackfood cases, including ill-defined scoring, lightweight board and unstable case dimensions.

The 200 series has undergone two significant revisions since its introduction to keep it ahead of its market, says Tony Hacker, which have provided significant increases in size range and speed as well as options such as 'tape present' detection which is available on both case erectors and sealers.

The 'tape present' feature ensures that cases which have not been effectively sealed don't leave the machine to cause problems on convey-

ors or automatic palletisers. The feature can be retrofitted to many different types of machine and is claimed to be far more effective than traditional 'tape broken' or 'run out' sensors.

In the years since it first developed the 700 and 200 ranges, Endline says it has evolved three distinct 'solutions' to suit the different approaches to end-of-line automation taken by snacks manufacturers.

For 'entry level' customers, producing bags at relatively low speeds, Endline offers a 'health check' which it says often results in a simple but effective improvement in efficiency.

Each case is erected manually and placed onto an angled packing table with clamps to support it. The clamps allow the operator to load with both hands, and the angle of the table is adjustable to suit the height of the operator and the case. When each case is full the operator closes the case and pushes it into the case-sealing machine, which tapes the top and bottom flaps.

There is scope to mount a wide range of ink jet printers, labellers and case counters onto the sealing machine, as well as sensors to detect how much tape is left on the reel.

Cases would typically be discharged onto short gravity conveyors, with palletising taking place alongside each packing point.

According to Hacker: "This simple, low-cost solution has led to many customers reducing manning levels to just one per bag-making machine, while packing at speeds of up to 60 bags a minute." It can also reduce the risk of RSI, he says, and improve material flows.

Endline's next solution is for what it calls semi-automatic applications and takes account of the much higher speeds achievable on modern bagging machines. It has developed a case forming aid and sealing system which it says 'complements modern bag-collating machines'.

The case forming aid is a twist on Endline's existing 100 series of case forming machines. It forms and secures the bottom flaps of each case and holds the cases in a comfortable, angled position. Operators then pick a bundle of bags from the collator belt and load each case prior to pushing it into a close-coupled case-sealer.

Endline developed its 600 series case-sealer

specifically for this task by fitting guides to close the top case flaps and seal them accurately.

The latest development in this range is a system designed for larger cases containing multipacks. The principle is similar but the cases are held in a different orientation. This helps operators overcome the problem of leaning into large, unstable cases to pack multipacks.

"Both designs mean the customer retains the flexibility and 'human inspection' element of manual packing but also cut down the time and effort it takes to erect, load and seal each case," says Tony Hacker. "As a result, each operator can cope with outputs well in excess of 80 single bags or 40 multibags a minute on these systems."

## Fully automatic operation

With improvements in the efficiency of fully-automatic case packers, Europe's biggest snacks manufacturers are becoming more confident in removing manual packing completely from the end of their lines. To handle this third, fully automatic type of application, Endline has worked closely with manufacturers of modular case packers to ensure its case erectors and sealers make their own contribution to the systems' overall performance.



**Case-packing aid:** Endline 100 series case forming machine

For example, since case packing machines rely on being fed with accurately sealed and 'squarely' erected cases, Endline points out that its 200 series achieves this through a combination of the dual opposing vacuum feature and a case squaring device.

If space is at a premium, customers can close-couple the erector, loader and sealer. Alternatively, the 200 is said to work equally well in remote-feeding installations where one case erector may feed a number of packers.

Endline's original snacks industry machine,

## SNACKFOOD REPORT

the 700 series case sealer, can be incorporated into any of these three 'solutions'.

Meanwhile, Quaker Oats has installed a new wraparound tray loader from Europack to handle cartons of fragile snack bars. Quaker Oats team manager Brendon O' Sullivan explains that similar product had previously been hand packed: "I liked the idea of forming the tray around the product rather than putting the product into pre-erected trays. The new system has enabled us to save time, reduce manpower and increase efficiency," he says.

For fully automatic bag packing, Propack Automation has introduced two case packers from German manufacturer J+P.

The model KF 350 packs bags horizontally into cases, either lying flat, slightly overlapped or shingled inside the case. Incoming bags are fed via a conditioning conveyor which gently flattens each bag, evens out its contents and transports the bag to the requested filling height. The bags are collated on flaps into the required pattern per row and then transferred through 'bomb-door' latches into the case.

The model KV 350 packs bags and block-bottom packs standing vertically in display trays and cases providing, says Propack, an effective alter-



**Pick-and-place:** *MTL100 machine from US manufacturer SWF for handling flexible packs*

native for all flexible packs which are difficult to handle using pick-and-place technology.

Pick-and-place case/tray packers built in the US by SWF are now available in the UK from DS Smith Packaging Systems and are specifically designed to handle flexible packs and make up to 45 placements a minute, handling a wide variety of snack foods in bags, including cookies, crackers, potato chips and other baked goods.

However, the company's direct loaders operate at speeds up to 240 bags a minute while the SWF shelf loaders are designed to case pack medium to large size flexible bags vertically at speeds up to 100 a minute.

Nor-Reg of Norway, represented in the UK by

Cornwell Products, has announced a new generation of automatic case packers as well as a more advanced pack quality management (PQM) system to monitor bags before they reach the machine. This will check bags for an upper and lower air fill, ejecting those outside set limits along with those that are long, short, misoriented, open, leaking or empty.

The new case packer is the CP-4700 which runs RSC cases or display trays without the need for change-over and can be put through a complete three dimensional changeover in less than five minutes.

Finally, Italian manufacturer Cama has recently supplied a major European snackfood company with several pick-and-place lines to pack twin cavity thermoformed trays into dual purpose transit/display cases. Speed is up to 300 trays a minute and 20 cases or display boxes a minute.

### FOR FURTHER INFORMATION:

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<b>Cornwell Products</b>	<b>enter</b>	<b>198</b>
<b>Endoline Machinery</b>	<b>enter</b>	<b>199</b>
<b>Europack</b>	<b>enter</b>	<b>200</b>
<b>Propack Automation Machinery</b>	<b>enter</b>	<b>201</b>
<b>DS Smith Packaging Systems</b>	<b>enter</b>	<b>202</b>