

# Electronics in full flow

TODAY'S ELECTRONIC FLOW-WRAPPER IS A VERY DIFFERENT ANIMAL FROM EARLIER MECHANICAL MACHINES WITH ELECTRONIC ENHANCEMENTS. MACHINERY UPDATE VISITED ROSE FORGROVE TO DISCUSS THE CURRENT STATE OF DEVELOPMENT.

Nearly 20 years ago the introduction of electronic controls and separate motor drives for each axis heralded a new era for flow-wrappers. Since that time the technology has become much more widely adopted beyond the specialist high speed wrappers built that way during the mid 1980s and today the emphasis has moved more towards flexibility, lower cost of ownership and enhanced hygiene.

Higher speed modified atmosphere machines have also become available to meet growing demand for enhanced shelf life products, with speeds of 200 a minute, depending on product length, not uncommon.

The revolution in flow-wrapper design followed a period in which the term 'electronic control' was widely bandied about when any form of electronics were attached to what essentially remained mechanical packaging machines. One example was the use of a servo motor to replace the handwheel fitted for manual adjustment of the gearbox – often hailed as automatic size change.

But what made real push button size-changing possible for the first time came when the mechanical gearboxes connected to a single drive motor were discarded in favour of three or four separate servo motors, synchronised not mechanically, but with software.

Controlling the infeed, film feed, and sealing mechanisms separately – and sometimes the film unwind via a fourth axis – not only made size changing quicker, but also allowed machines to overcome two of the age old problems with mechanical flow-wrappers.

The first of these problems is producing an empty bag when a product is missed on the infeed. This not only wastes film, but also creates a problem of separating empty bags from full packs at the discharge.

The problem is overcome on the electronic flow-wrapper because products are sensed and the infeed conveyor and film drive are sepa-



**Electronic control:** Above: Entry level Merlin HSE flow-wrapper with three-axis servo drive. Left: PakFeed 1000 multi-belt feeder



ately controlled. This allows an electronic flow-wrapper to have the so called 'no product – no bag' facility.

The second mechanical flow-wrapper problem overcome by the electronic machine is chopping a product in half when the product moves out of position between the infeed conveyor and the cross seal jaws.

## Operation interrupted

On the electronic flow-wrapper, product position is sensed and operation of the cross-sealing jaws can be interrupted if the product is out of place. This avoids damage not only to the product, but also to the cross-sealing jaws and knife assembly, and prevents the machine getting contaminated by mashed up pieces of product.

Over the years servo drive has filtered down from the high speed machinery associated with confectionery wrapping at speeds of sometimes 800 a minute or more to relatively low cost starter-level machines.

Take, for example, the latest version of Rose Forgrove's starter level machine, the new Merlin HSE, which has been designed to provide users with budget flow-wrapping, flexibility and three-axis servo drive, as well as a range of options. Chief among those options is stainless steel construction, reflecting a general trend towards stainless on hygiene grounds, and IP65 protection.

But the Merlin HSE also has a re-engineered control system that contributes to lower cost and can be equipped with a simple budget-priced automatic infeed system, or indeed a more advanced multi-belt feeder. In addition, twin sealing jaws are also available, raising maximum speed from some 70 items a minute to 200 a minute.

Flexibility is improved also by the machine's ability to handle products up to 160mm high.

However, in just the same way that most areas of packaging equipment are experiencing an element of polarisation between quite adaptable starter level machines and high speed dedicated lines, so it can be with flow-wrapping.

For example, Rose Forgrove has found that

## FLOW - WRAPPING

as the costs of automatic handling have fallen over the past few years, so demand for more fully automated and purpose-built lines has increased.

One recent installation has been a machine for handling a medical device in which the flow-wrapper was equipped with a purpose built feeder to add sachets of liquid to the pack, a tear tape applicator for the main pack itself, print registration, gas flushing and a vision system to check the film. The machine is also linked to the user's main factory management information system.

### Packaging security

In another application Rose Forgrove has supplied a specialist line for handling trays of grapes, using a purpose designed feeder, built to a tight budget.

Elsewhere it is significant that packaging security procedures, with bar codes to identify film and vision systems to check the presence of overprinted codes, have spilt over from the pharmaceutical industry into less critical but nevertheless quality conscious fields. Wet wipes wrapping has been one recent application for Rose Forgrove, with both pack and label verified by OCR.

Overall, the demand for more and more automation has led the company to develop a series of feeders to complement its wrappers and bring an element of modularity and reduced cost to what were in the past often totally bespoke solutions.

For example, there is now a new multi-belt system to provide high speed, non-contact phasing of product arriving at random pitch.

Available with two to eight servo driven belts, the PakFeed 1000 feeder is capable of handling up to 600 items a minute, depending on product type, length and the number of belts employed, and can be fully integrated with the wrapping machine. This means that the two machines can then be controlled from a single touch screen display, with the settings for both feeding and wrapping particular products held together in the memory for immediate recall.

A full washdown version is available, built to a higher specification, designed on a modular basis with each belt readily demountable for cleaning off line, along with its 'motor triangle' of idling and drive rollers.

As a result, downtime for cleaning – particularly when dealing with deposits that require soaking – can be virtually eliminated, with a spare belt module employed while belts are

taken off the machine and cleaned, one after the other.

Most multi-belt feeders deliver into the lugs of the flow-wrapper's infeed chain. However, Rose Forgrove has also developed a high accuracy lugless version of its new feeder, which reaches into the flow-wrapper, so avoiding damage to soft or sticky goods by the lugs or by dragging on the bed of the flow-wrapper itself.

Instead, timing belts deliver product into the folding box accurately pitched, typically to an accuracy of  $\pm 1\text{mm}$  at speeds of 500 a minute.

Other new feeders available from Rose Forgrove include a floating gap unit in which a bull-nose variable length conveyor is teamed up with one or two smart belts to provide contact-free separation and an element of accumulation. This system would usually be employed for lower speeds than a multi-belt feeder, but offers smoother acceleration and deceleration, which suits jobs such as penny-stacked collations that might otherwise topple.

For feeding products where contact and the pressure of backlog accumulation is not an issue, Rose Forgrove supplies the ILF unit, which holds accumulated product against a gate, releasing and accelerating individual items into the lugs of the flow-wrapper's chain. And for ease of cleaning, particularly within the meat industry, there is also now a wheel-away infeed with no electrics, allowing thorough cleaning off line in a few minutes, with steam if necessary.

Further recent developments include what is believed to be one of the world's widest flow-wrappers, an Integra HS built specially to handle 15in pizzas. The machine employs box motion 450mm wide sealing jaws for the hermetic seals required in modified atmosphere packaging, accepts film up to 900mm wide and is equipped with automatic splicing. Speed is up to 200 a minute.

### Simplified version

Indeed, the HS was introduced by Rose Forgrove last year as a higher speed version of its existing Integra PC high integrity seal wrapper, along with a simplified PLC controlled version of its Minerva wrapper.

The new PLC version of Rose Forgrove's Minerva PC Flowpak employs an Allen-Bradley Kinetix 6000 multi-axis servo drive system and the graphic PanelView Plus human-machine interface. The Allen-Bradley Kinetix 6000 system also includes the Sercos interface, a single, digital fibre optic link, and a single, simple

power rail, to simplify the Minerva's electrical system.

Two new operating features allow on-the-fly adjustment of bag length and instant and automatic jaw obstruction recovery, allowing a trapped product to be safely recovered and production resumed with minimal loss of film and time.

For although virtually all servo driven machines provide misplaced product detection, there are limits, particularly if the product is slippery, such as frozen food, penny stacked, such as hamburgers, or may vary in width and run the risk of not always being carried along securely by the film.

Most misplaced product detectors operate via photocells, which means that monitoring must usually take place immediately before the folding box to cater for completely opaque print or metallised film. However, in the short distance to the cross seal jaws the product can move out of pitch, or the top item of a stack fall forward or back.

Therefore the 'soft jaw' system on the Minerva senses any extra resistance as a result of misplaced product, backs off instantly and allows a double wrap to pass through for subsequent rejection without stopping the machine.

### Reduce cost of ownership

So while automation in flow-wrapping is generally achieved at lower cost today than even a few years back, what else can help reduce the cost of ownership?

A prime method is, of course, to reduce the risk of downtime for unscheduled maintenance. One way put forward by Rose Forgrove is for users to keep stock of certain factory-built exchange modules such as a fin seal roller assembly. In this way, should the heater element fail, for example, then the entire assembly can be replaced in minutes against what could well be a couple of hours for repairs.

Indeed, the company is also currently seeing increased demand for routine service maintenance contracts which, it believes, not only keeps reliability and performance up to par but ultimately cost considerably less than emergency call-outs. When service engineers' time is planned and parts can be procured on a longer lead time, then it's clear that both can be offered at reduced cost. ■

*Machinery Update editor Michael Maddox was talking to Rose Forgrove engineering director Dr Jim Goodwin and sales manager Steven Moore.*



**Modified atmosphere:** Fuji Alpha 6 FW3400B has box motion jaws

PARAMOUNT PACKAGING SYSTEMS

## Flow-wrapper range now includes high speed MAP

Japanese manufacturer Fuji, represented in the UK by Paramount Packaging, has launched a new series of flow-wrappers, the Alpha 6 series, all built as standard in stainless steel on a balcony basis for hygiene and easy cleaning.

The redesign has seen a reduction in the number of parts compared with earlier models, reducing complexity and maintenance requirements, while enhancements across the range include an easy view pendant operator screen and induction heaters for all fin seal wheels.

These replace slip rings, giving higher temperature accuracy, reduced energy consumption and less maintenance.

The new range signals Fuji's move into high speed modified atmosphere packaging with the FW3400B which employs box motion sealing jaws to move with the film and give extended dwell times for hermetic seals at speeds up to 200 packs a minute. Applications include pharmaceuticals and medical devices.

Two servo motors are used to drive the jaws – one for longitudinal movement, the other for jaw closing – rather than a single drive, providing the higher speed and more accurate control. Separation of the two motions also means that jaw opening distance can be reduced on lower profile packs, again helping to reduce cycle times. A mechanically driven cut-off knife is used.

There is also a new Fuji four-side seal machine, the FW 3431/FS with applications in both the food and medical device industries.

Capable of running two different films for the

top and bottom webs, the machine allows sliced meat, for example, to be packed without a tray on a metallised film base covered with clear film and for medical devices to be packed in film and paper laminate, with easy open tabs. Gas flushing equipment is optionally available.

Fuji's new high-speed Alpha 6 wrapper is the FW3400, capable of speeds up to 300 items a minute for applications within the confectionery and bakery industry.

There is also a new inverted model, the FW3410BSB for soft or sticky products that are best carried through the wrapping process on the film itself. Equipped with a 2 metre long infeed to allow direct placement of product onto the film, the machine is able to operate in continuous or intermittent mode, depending on product and feed method employed.

T: 01252 815252

E: [fuji@paramount-packaging.co.uk](mailto:fuji@paramount-packaging.co.uk)

ILAPAK

## MAP wrapper challenges thermoformers with low O<sub>2</sub>

Ilapak has announced a new modified atmosphere packaging system which, says the company, for the first time offers a flow-wrap alternative to vacuum thermoforming, giving the same low levels of residual oxygen – below 0.5 per cent – for extended shelf life products.

Called MapVac, the system is available on Ilapak's Delta electronic flow-wrapper.

"MapVac's ability to match the shelf life capabilities of thermoforming machines marks a real breakthrough," says Ilapak, "so manufacturers can now achieve optimum shelf life for items such as dairy products, bakery products,



**Modular construction:** Synchronpack 900RT flow-wrapping machine from Propack Automation

poultry and pizzas, yet with the benefits of a flow-wrapping – flexibility, ease of use and high speeds.”

The new system, which is already being used by one of the UK’s leading tortilla producers, uses a series of vacuum chambers to minimise the residual oxygen levels in the pack, rather than the gas flushing technique employed by traditional MAP machines.

Ilapak points out that the new system provides considerably faster changeover compared with thermoformers and, as a flow-wrap system, allows full wraparound printing, unlike thermoforming.

When modified atmosphere is not required, the Delta flow-wrapping can be used as a conventional machine.

T: 0208 797 2000

E: sales@ilapak.co.uk

PROPACK AUTOMATION MACHINERY

## Flow-wrappers use modules for tailor-made approach

A range of electronic servo-driven flow-wrappers that can be built up from a series of modules to provide what is said to be virtually tailor-made machinery is now available from Propack Automation, agent for the Spanish manufacturer Synchronpack of Barcelona.

The Synchronpack range is based on three families of machines: the Pack 9 series, a top reel machine for regular shaped items; the Pack 6 series of bottom reel wrappers for irregular,

sticky or fragile products; and the Pack 3 series which uses both top and bottom reels to produce a four-side-seal pack for low height products, peelable seal packs, mailing pouches and similar applications.

These three families are available to run at maximum speeds of 30, 40, or 60 metres a minute and, depending on model, with maximum film widths of 300-900mm in 200mm increments. There is also a choice of rotary sealing or box motion long dwell sealing for modified atmosphere packaging.

All the machines are PC controlled and servo operated. Optional equipment includes a range of feed conveyors, trimming for the fin seal, and a pneumatic or mechanical side gusseting device as well as automatic splicing and format change.

Synchronpack also builds special purpose

machinery, such as the LTS “window” pack flow-wrapping aimed particularly at the wet wipes market.

This machine punches a hole in the film before wrapping takes place, covering the “window” with either a peelable label or a rigid lid and peelable label for consumer access. A tamper evident label is also applied over the reclosable element.

“Synchronpack’s modular approach to the design of its flow-wrapping machinery means that what is virtually tailor made equipment can be provided on relatively short lead times at extremely competitive prices,” points out Pat Fleming, managing director at Propack Automation.

T: 024 7647 0074

E: office@propack.co.uk

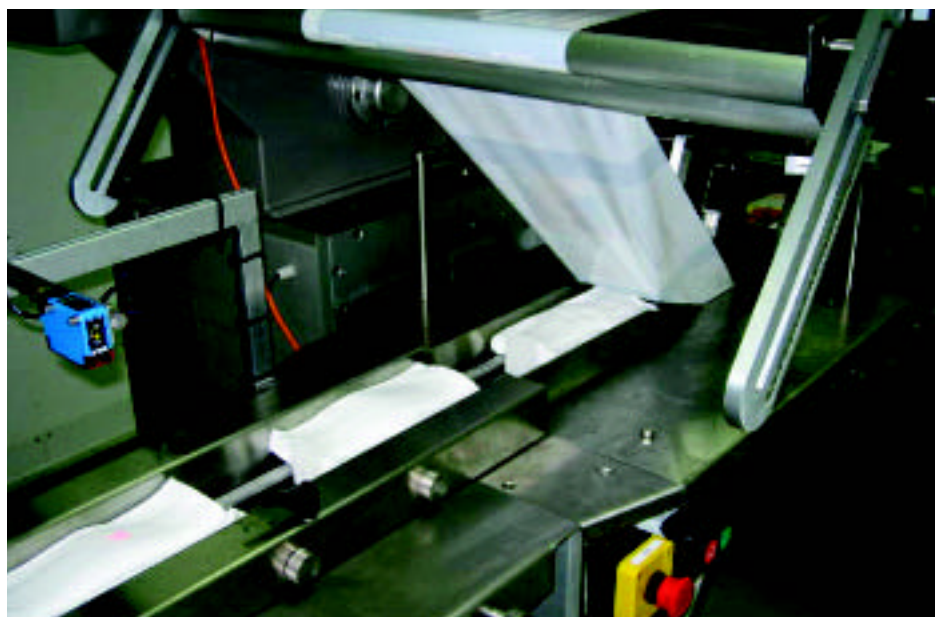
PFM PACKAGING MACHINERY

## Wet wipes wrapper helps meet increased demand

Wet tissue manufacturer Severn Delta is meeting increased demand with a PFM Mistral flow-wrapping on a recently installed manufacturing line at its new factory in Bridgwater.

An all-stainless steel machine, the Mistral is said to be well suited to operating in a clean room environment while the three-axis servo drive enables size changes to be made quickly and accurately.

Plastic carrier plates on the infeed chain



**Wet tissue wrapping:** Stainless steel PFM Mistral installed at Severn Delta



**Produce packaging:** The New Gazzella Top Seal inverted flow-wrapper from Record Packaging

transfer the stacks of tissue into the adjustable folding box while rotary D-cam motion long dwell cross-seal jaws are employed for hermetic sealing.

An independent pneumatically operated knife provides a clean cut and separation of the packs even, says PFM, when working with laminate wrapping materials up to 80 micron or more.  
T: 0113 239 3401  
E: sales@pfm-ltd.co.uk

INTEGRAPAK

## Automatic line uses modular product handling system

US manufacturer Delta Systems has announced an automatic flow-wrapping system incorporating a modular product handling system that can be readily adapted to suit a broad range of different products.

The first systems have been installed in North America and Europe for confectionery applications although systems for frozen foods are also currently on order, says UK agent Integrapak.

The product handling section allows products to be received either in rows and/or at random without changing the core components, while the smart belt infeeds are available in a wide variety of designs and configurations. Some can also be selected or deselected from the touch screen depending on the product, allowing different product handling philosophies to be employed on the same system.

This is said to be particularly useful when changing from fragile, irregular shapes, or sticky products to more uniform products that can be delivered at higher speeds. Infeeds may be low pressure or non contact and may even exclude the use of lugs for particularly soft snack-cake style products.

The modular construction was developed for a customer who wanted to move the automated system quickly from line to line and eliminate hand feeding. Integrapak says that one of the Delta lines has replaced three manually fed wrappers on each production line.

T: 01420 593680  
E: integrapak@integrapak.co.uk

ERAPA (UK)

## Benchtop machine offers speed up to 50 a minute

A compact bench-mounted flow-wrapper aimed at entry level applications as well as existing users that need off-line capacity for short runs is now available from Erapa.

The Little Flow is able to provide a maximum pack size of 280mm long x 90mm wide and 50mm high at speeds of up to 50 packs a minute, and operates from a single phase supply with no need for compressed air.

It has an adjustable variable speed lugged infeed conveyor and an adjustable forming box, while the main control panel is mounted on a swivel tower for easy access.

The Little Flow is part of a range of flow-wrappers in which the top model, the four-axis servo driven Sfera is able to reach a speed of 600 packs a minute.

T: 01582 722 462  
E: info@erapa.co.uk

RECORD PACKAGING SYSTEMS

## Random length produce packed by inverted machine

Aimed at fresh produce packing, the Gazzella Top Seal inverted flow-wrapper announced by Record Packaging handles a variety of variable size products such as celery, leeks, peppers, asparagus and lettuce.

The machine is equipped with a box motion sealing head to cope with height constraints and to ensure a tight pack, while pack length is adjusted automatically to the length of the produce. Speed is up to 60 a minute.

The longitudinal seal can also be trimmed to a bead seal which, when used in conjunction with the optional shrink tunnel, provides a tight pack for vegetables such as swede, cabbage and broccoli.

T: 0161 864 3971  
E: sales@recordpackaging.com

HAYSSEN EUROPE

## Dies on a wheel give hermetic sealing at high speed

Hayssen Europa has raised the speed of its RT – rotary turret – range of flow-wrappers which are now able to provide speeds up to 600 modified atmosphere packs a minute, using multiple sealing dies on a wheel to give the long dwell time required for hermetic seals.

This long dwell time also enables reclosable zipper profile to be included at high speed – up to 150 packs a minute – for products such as mini-portions of cheese as well as larger family packs.

The Veltron servo driven infeed system is available to provide product accumulation and correct product phasing at elevated speeds.

T: 01842 754171  
E: info@hayssen.co.uk