

Flow-wrapping speeds put the Focus on feeding

FEED SYSTEMS HAVE BECOME JUST AS IMPORTANT AS THE FLOW-WRAPPER ITSELF.

Not that long ago – certainly no more than a decade – flow-wrappers were seen largely as standalone machines but now, in the UK, they are much more likely to be supplied as part of a fully automatic product handling and packaging system.

Market demand for complete solutions has therefore led flow-wrapper manufacturers to become product handling specialists which, inevitably, has meant concentrating on one or two industries or product types to build up the expertise. So, for instance, some companies have specialised in handling countline biscuits, others in handling biscuits on-edge, others handling cheese, while others have specialised in handling medical devices and hardware items.

Flow-wrapper manufacturers have also needed to develop a range of product feeding and handling equipment, and to work with materials handling specialists to cope with different types of product, plant layout and pack configuration. In the past this was thought of as ancillary equipment or accessories, but the value of the feeding and product handling equipment can now frequently exceed the cost of the flow-wrapping machines themselves.

The focus of attention at the equipment specification stage has also shifted. And, as Mike Perfect, technical sales support manager at Autowrappers explains, "It's fairly typical for us to spend three times as long talking with customers about the feeding system for a particular flow-wrapping project as the flow-wrapping machine itself and the style of wrap."

The two factors that have the greatest influence on the design of the feed system are the nature of the product – is it hard, soft, a regular shape, irregular, robust or easily damaged? – and the nature of the production process – is it continuous, batch, easy to stop, slow to stop, or impossible to stop?

In situations where the process is slow or impossible to stop should the flow-wrapper stop, some hard decisions need to be made.

Do you install extra flow-wrappers waiting to

take production if other machines stop? Do you employ sufficient people to tray-off the product when a machine stops and then feed it back when the flow-wrapper starts again? Do you dump the product or sell it as pig food? Or do you install a product accumulation system that can store product while the flow-wrapper is stopped and re-introduce it to the line again when the wrapper restarts?

Each of these four options is expensive, but the option of using 'spare' people to tray-off in the event of a stoppage is no longer available in most factories as the labour costs prohibit additional people.

Product accumulation systems are therefore increasingly popular. For countline products which are fed to the packing area in rows, a product accumulation system can be as simple as a conveyor belt which accepts rows of product one at a time, indexing one way, and when the wrapper restarts reverses and feeds the rows back into the system.

These systems are relatively inexpensive but, for a given floor area, are limited in capacity to only a few minutes of production and so can only cope with a very short stoppage.

Higher capacity accumulation systems are required to cope with more serious stoppages and for production lines involving plant such as biscuit ovens, where 20-30 minutes can pass between the start of manufacture through to the final packaging.

Series of shelves

Autowrappers' solution to this problem is its Verso-stor accumulation system, which consists of a series of shelves, the width of a row of products, which are supported between two chains. The shelves are loaded with product a row at a time, with the chain indexing the shelves upwards when each row has been positioned.

The shelves rise to the top of the store where the chains run over a pair of fixed sprockets at the top of the accumulator. The chains then pass down around a pair of moveable sprockets and

then back up to the top of the accumulator to another pair of fixed sprockets.

The chains continue to pass over a series of pairs of fixed sprockets and then under moveable sprockets until they reach the discharge position of the accumulator where the rows are discharged from the shelves onto a conveyor running at right angles to the accumulator.

Once emptied, the shelves move down to the bottom of the accumulator, the chains passing under pairs of fixed sprockets and over pairs of moveable sprockets.

Path as short as possible

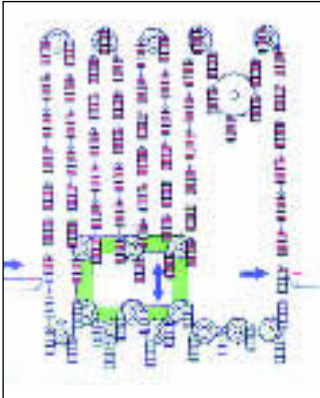
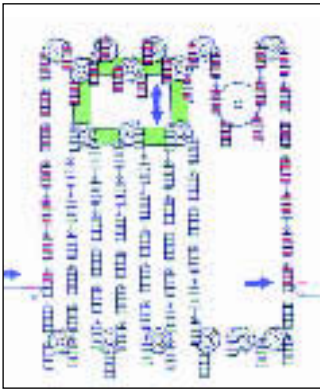
In normal production, with the process line and the packaging equipment running, the moveable sprockets are raised to the top of the accumulator. This ensures that the path of the shelves of product is as short as possible, but with the return path of the chains at its maximum length.

However, if the packaging equipment stops, the moveable sprockets are progressively lowered so that the product can continue to enter the store, even though no product is being discharged. When the packaging equipment restarts, product is again discharged and the moveable sprockets rise as the product is taken away from the accumulator.

"The size of a Verso-stor is very much a question of how much space the customer has available," explains Mike Perfect at Autowrappers. "The width is determined by the customer's process line, but the length depends on the floor-space available. Typically the height of the store will also be limited by the height of the ceiling in the factory, but we have built Verso-stors which pass through the ceiling and occupy two floors."

Gainsborough Craftsmen also builds buffer storage systems for flow-wrapping lines and has supplied vertical systems – on a first-in/first-out and a first-in/last-out basis – as well as horizontal versions operating on a first-in/first-out arrangement.

Each is designed specifically for the process and some vertical versions have been built



Autowrappers Verso-Stor: Normally, trays are carried the shortest route (top left). If the flow-wrapper stops, the movable sprockets descend (bottom left) lengthening the path to give more storage capacity



SIG pack buffer: Inclined chain with pockets for the product creates a 'multi-storey car park' effect

6 metres high, and with integral cooling units.

SIG's latest accumulation system is the new FS pack buffer which accepts products in single lane and so, in place of the more usual series of shelves, employs an endless chain with pockets to store and then return product to the line on a first-in/first-out basis.

Length of chain

This chain is driven at a speed that synchronises with the rate of supply while the degree of accumulation required – to balance input with the capacity of downstream equipment – is achieved by lengthening or shortening the amount of chain given over to storage.

The chain is also inclined so that several layers of accumulation can be provided within a rectangular footprint – like a multi-storey car park. No special infeed units are required and there are no transfer points within the system which, says SIG, can be readily adapted to

meet particular customer requirements.

Products in trays, pillow packs, cartons, bottles and also unpacked items can be handled by the FS storage system which can also cope with products that travel shingled through the system – such as flat bags – and in one or more rows – such as blister packs.

The key step in most product handling schemes is the process of taking the product from the production lines, where it may be in rows over a metre wide, and encourage it into single file for feeding to the flow-wrapper. This has to be achieved without damage to the product and usually in such a way that the product can be presented to different flow-wrappers when one machine stops.

There are two basic strategies for single lining. One takes advantage of the fact that many products are delivered from the production line in neat rows, while the other assumes that the products will be in random order.

Transver, now part of Bosch Packaging Technologies, specialises in conveying and single lining biscuits and confectionery products in general, but is perhaps best known for its row-by-row handling systems.

Typically these systems will consist of a belt conveyor which accepts full width rows of product from the production line. Set into this conveyor are a series of diverter mechanisms which allow a complete row of product to be either raised up or dropped down onto a conveyor running at right angles to the main conveyor.

When this system is used for countline biscuits, the products at this stage will be moving broad side leading. The next step therefore is to turn the bars through 90deg. This can be done in several ways but for high speed operation two belts running at different speeds are often used.

However, this is by no means the only system offered by Transver as Simon Smith, technical sales director for agency products at Fords Packaging Systems, which now represents Transver in the UK, explains: "Transver has a wide range of product feeding, distribution and single lining systems which can now be supplied to any flow-wrapper supplier in the UK through Fords and not just with SIG flow-wrapping machines."

Frozen products

Not all products lend themselves to being dealt with a row at a time since, during production or the conveying process, they become merged together. This is particularly true of frozen products such as beef burgers or pizzas, which may enter the spiral freezer in neat rows, but are discharged in what can only be called random order.

The basic technique is first to accelerate products away from the freezer, so creating space between them in the direction of flow. Then the products can be channelled progressively into single file using angled guide rails or angled conveyor belts mounted on alternate sides of the conveyor.

Once the products are in a single line, the next step is to distribute them to the appropriate flow-wrapper and then to synchronise their speed and pitch with the infeed lugs of the flow-wrapper, usually via a multi-belt feeder.

These typically employ up to eight or even ten servo driven belt conveyors which, with photo cells sensing the position of incoming product, accelerate or slow each product so that, by the time each reaches the final belt, it is precisely timed with the flow-wrapper.

One of the most recent to be announced is an

integrated version of the Ilapak Indy multi-belt feeder for the company's Carrera 2000 PC electronic flow-wrapper. Both machines are operated from a single screen which, says Ilapak, makes the system quicker and easier to use.

Previously available only as a separate unit, the Indy's new, integrated design and simpler control system have also reduced manufacturing costs, says Ilapak, making the system more economic. Hygiene has also been improved with a 'wash down' specification while feeding belts can be removed for cleaning without tools. Four, six or nine belt versions of the Indy feeder are available.

Handling delicate products

Among recent feeders from Autowrappers is a system using five servo driven belts to handle delicate products such as Turkish Delight. The five conveyor infeed system limits contact between products to the minimum and allows products to be synchronised and delivered to the flow-wrapper in phase at speeds up to 450 pieces a minute.

However, for stacks of cheese slices Autowrappers had to develop a completely different feed system to ensure that products never touched each other. This feeding device uses three belts and incorporates a moving nose.

The infeed belt accepts products in random pitch and then passes them over the moving nose, or shuttle, to the second belt conveyor. A photocell mounted over the moving nose senses the back of the product and moves the nose backwards to a preset distance behind the product.

If no further products arrive, the nose moves at the fixed distance behind the product towards the flow-wrapper and the first conveyor lengthens while the second conveyor reduces in length. However if more products arrive, the nose moves progressively backwards as each new product is sensed, lengthening the second conveyor while shortening the first conveyor.

The precisely spaced products on the second belt then pass onto the third belt which is synchronised to the infeed lugs of the flow-wrapper. Mike Perfect at Autowrappers says that this infeed system can work reliably at 350-400 pieces a minute and has been installed for cheese slices and similar applications in many different parts of the world.



Ilapak Indy feeder: Shares control panel with Carrera wrapper

Feeding with robots

In just the same way that robotic systems are beginning to provide a readily programmable method of feeding cartoners, so it is with flow-wrappers.

For example, Spanish baker and confectioner Pauni has invested in robot-based automation equipment from ABB, to provide improved handling and packing for its Mildred brand croissants. The complete system includes eight ABB IRB 340 FlexPicker robots, four sets of ABB's PickMaster system integration software, four vision systems, and eight remote cameras.

The FlexPicker robots are employed to pick up the bakery products from the output conveyor leading from the ovens and place them on conveyors that feed eight flow-wrapping machines.

The positions of the croissants on the output conveyor are captured by the vision system cameras and signalled to the PickMaster systems. The PickMaster systems then track the products and allocate picking tasks accordingly, to balance the workload across all eight robots.



The system handles some 50,000 products an hour with each robot running at a rate of 105 picks a minute, operating virtually round-the-clock on a three-shift basis.

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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.

Instead, timing belts deliver product into the folding box accurately pitched, typically to an accuracy of ± 1mm at speeds of 500 a minute.

Feeders soon to be 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.

As multi-belt feeders get faster and even more belts are involved, so cleaning and maintenance becomes an increasingly important point to consider. Indeed, Paramount Packaging Systems has now introduced a multi-belt feeder developed by Japanese manufacturer Fuji to run in tandem with its high speed flow-wrappers and to cut downtime for belt cleaning to the minimum.

Aimed in particular at the confectionery, biscuit and pharmaceutical industries, the Fuji FFS1000 feeder uses a series of eight independently controlled belts to adjust the space between incoming products. This provides the accuracy for the flow-wrapper to run continuously at speeds up to 1000 a minute.

However, unlike conventional multi-belt feeders, on which belts need to be removed from their support rollers and drives for cleaning, each belt on the Fuji feeder is carried on its own removable and interchangeable cassette, which houses the rollers and drive connections.

Each cassette can be removed, in seconds, for the belt to be cleaned off line. In the meantime, production continues using the spare belt cassette supplied with the machine.

Racetrack collator

Fuji also builds racetrack collators, one of which has been supplied by Paramount to tea packer Ringtons, Newcastle, to feed a new Fuji Alpha 5 Jumbo flow-wrapper designed specifically to produce large bags, carrying 80 or 160 tea bags. These have now replaced cartons for Ringtons' own brand.

The racetrack collator accepts sachets of 40 bags from the primary wrappers into pockets for presentation at the correct pitch to the infeed of the Jumbo, where two or four sachets are swept in, to make multi-packs of 80 or 160 tea bags as required.

The entire system operates at a speed of around 100 sachets of 40 tea bags a minute, with the Fuji Jumbo running at 25 or 50 multi-packs a minute, depending on size, although speeds can go higher to cope with any backlog.

Flow-wrap multi-packing of countline products and other confectionery is now firmly established as a marketing tool and is even starting to replace other forms of secondary packaging such as cartons. However, marketing departments inevitably want the facility to alter the

number of products in the multi-pack at the drop of a hat. At the same time, the traditional method of taking a single multi-pack of, say, three or four chocolate bars and creating a double or triple collation to give multipacks of six to 12 is particularly wasteful on film.

So to give manufacturers maximum flexibility, Autowrappers has designed the Multipack collating system that can produce collations as small as one row of three up to a collation of three rows of 12 at up to 600 individual primary packs a minute. Changing from one collation to another is simply a question of keying in the required collation configuration.

The Multipack collator, which can be fitted onto any of the company's Flowtronic or Versoflow flow-wrapping machines, starts with a conveyor section which accepts packs at 90deg, long edge leading, from the cross seal jaws of the primary wrapping machine.

Each layer is then counted off and controlled via a series of paddles carried on a top conveyor before being carried through a pivoted swing-arm diverting channel that indexes upwards, feeding layers of product forward into a stack, each layer held on ledges to avoid scuffing.

Lugs carried on a top conveyor then sweep the completed collation off the supporting ledges and into the infeed of the flow-wrapper. Collator modules are servo controlled and details of 40 different pack counts can be held in memory for changeover within 5 minutes. ■

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High speed MAP: Updated PFM Scirocco

PFM PACKAGING MACHINERY

MAP wrapper offers speeds of 200 a minute

Capable of 200 hermetically sealed, gas flushed packs a minute, the updated high speed Scirocco wrapper introduced by PFM employs a new design of sealing jaw and is aimed predominantly at dairy and meat products.

Five of the servo motor driven machines have already been ordered by UK companies, amongst them The Cheese Company in Oswestry and a major sausage producer.

The updated design includes an automatic reel splicer, which is incorporated into the cantilevered frame to reduce the overall footprint, and no product - no bag and misplaced product detection. Control is via a colour touch screen.

The Scirocco can also be fitted with an automatic feeding system and will in many cases double the throughput of current MAP lines, says PFM.

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HAYSSEN EUROPE

Dies on a wheel provide hermetic seals at high speed

The new RT5000 CPM – cheese packaging machine – announced by Hayssen Packaging Technologies provides high integrity seals, particularly for MAP, at speeds up to 500 a minute, and has applications also in wet wipes production and medical device packaging.

Based on the established Hayssen RT system of using multiple sealing dies on a wheel to give the long dwell time required for hermetic seals at high throughput, the machine features a colour touch screen control, Allen-Bradley

FLOW-WRAPPING

PLC, remote diagnostics via modem, integrated gas analyser and misplaced product detection.

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

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ROSE FORGROVE

Higher speeds and simplified electrics

Rose Forgrove has introduced a higher speed version of its Integra PC high-integrity seal machine and a simplified, PLC controlled version of its Minerva wrapper.

The Integra, which employs a box motion sealing system to give the extra dwell time for high integrity seals, is now typically able to operate at speeds of 150 a minute on pack lengths of 160mm. Built in stainless steel, the machine is aimed in particular at modified atmosphere packaging.

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.

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.

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.

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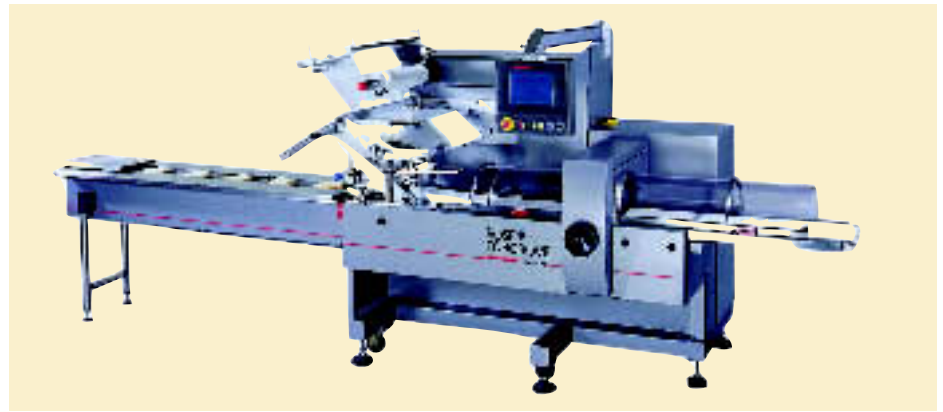
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AUTOWRAPPERS

Multi-machine line handles chocolate bars

Autowrappers has recently supplied a major confectionery manufacturer with a multi-machine installation to provide primary and multi-pack wrapping of enrobed chocolate bars.

A single input conveyor and four cross conveyors feed four high speed Flowtronic 120



Simplified electrics: Rose Forgrove has introduced a PLC controlled version of its Minerva machine

wrappers, each capable of handling two sizes of three different chocolate enrobed bars and which together provide throughput up to 1800 packs a minute. Three wrapping machines run at peak speed with the fourth machine on standby and to take product from the refeed.

Wrapped products are then fed into either a fifth Flowtronic machine producing six-bar multipacks or a Bradman-Lake cartoning system which loads 60 bars into pre-erected cartons for retailers.

To meet demand for faster and more flexible biscuit-on-edge applications, Autowrappers has also developed the new Flowtronic 130 BOE flow-wrapper. It uses Allen Bradley's Control Logix system to control an eight axis Kinetix servo drive package.

Together with other design features, this allows the Flowtronic 130 BOE to be adjusted to most product sizes and collations with minimal change parts and, in some cases says Autowrappers, with none at all.

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FORDS PACKAGING SYSTEMS

Brazilian range includes 1800/min candy wrapper

A range of flow-wrappers built by Brazilian manufacturer Masipack has been launched on the UK market by Fords Packaging Systems, including a high speed candy wrapper capable of handling hard boiled sweets at 1800 a minute.

Fords says the machines "will bring a new meaning to value for money within the UK and European market for packaging machinery."

All models are servo controlled and fitted

with automatic film splicers for uninterrupted running. Both cold seal and heat seal packaging materials can be accommodated as well as monolayer ldpe and ldpe shrinkfilm.

No product - no bag and no gap - no seal features are included on the machines.

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ILAPAK

Inverted wrapper has automatic length sensing

Ilapak has redesigned its Astra inverted flow-wrapper, aimed at handling irregularly shaped products and those that are best placed directly onto the film before wrapping.

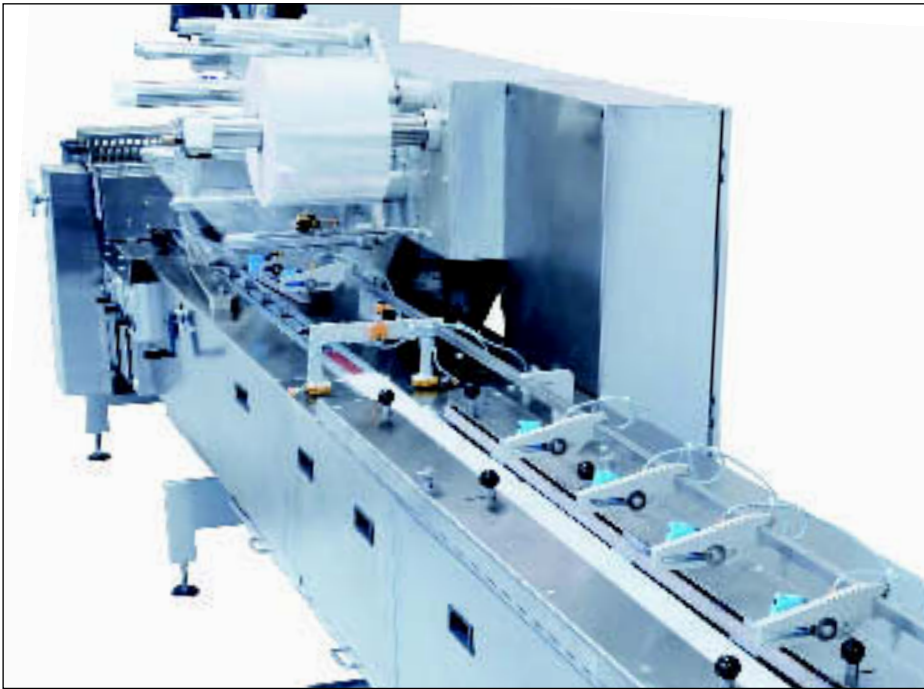
This includes all types of fresh produce, bakery products and cheeses, as well as non-food items such as video cassettes, liquid soap and shampoo bottles.

Controlled by an industrial standard micro-processor and operated using an LCD display panel, the Astra has an electronic self-measuring facility to adjust pack length automatically to suit each individual product. Additional electronic features such as automated product size change are also included as standard.

An integrated indexing belt - previously an option - is now included as standard. This automatically positions products accurately on the film, making operation easier.

Capable of speeds up to 50 packs a minute, the Astra can produce packs of unlimited length, up to 320mm wide and up to 230mm high, using solid or micro-perforated polypropylene, shrink films and certain grades of polyethylene.

Ilapak has also launched a stainless steel ver-



US range: The Delta series of flow-wrappers is being launched in the UK by Integrapak

sion of its Carrera 500 PC electronic flow-wrapping, aimed at fresh produce, sandwiches, pizzas, meat and other products which are packed in damp environments or where potentially corrosive cleaning products are used.

Speed is up to 100 a minute and, says Ilapak, the machine offers smaller manufacturers a cost-effective way to benefit from electronic packaging technology.

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INTEGRAPAK

US range employs purpose designed software

A range of servo-driven flow-wrappers using motion control software written specifically for the flow-wrapping process has been introduced in the UK by Integrapak, newly appointed representative of the US manufacturer Delta Systems.

Called SoftFlow, the software runs on a standard industrial PC and, says Integrapak, provides improved flexibility and reliability. In addition, points out the company, SoftFlow has been successfully employed in the USA as a key component in upgrading machinery from other manufacturers to servo drive.

Aimed principally at the confectionery, bakery and frozen food markets, the Delta machines are built in stainless steel and provide speeds from 0-100 up to and in some cases exceeding 1000 items a minute. The range also

includes a model equipped with D-cam sealing jaws to provide longer dwell time for extended life products.

In addition, Delta builds a wide variety of product feeding and distribution systems including chicane singulation for random products; lift tables and transposers for row removal; and vibratory feeders for on-edge products. These are supplied with open architecture control systems which, explains Integrapak, allows re-programming for different applications or product styles to be carried out by the end user.

The feeders can also be readily linked to wrapping and secondary packaging machinery from other manufacturers.

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SOUDAL

Dedicated unit handles food service kits

A flow-wrapping developed specifically to handle the components of food service kits – cutlery, condiments, napkins and so forth – at speeds up to 240 kits a minute is now available in the UK from Soudal, agent for the US manufacturer George Gordon Associates. There is also a range of ancillary equipment to produce and dispense sachets and napkins.

The GPS-10 flow-wrapping is a bottom web machine which conveys the various items in the kits using a trough shaped conveyor and

employs a geometric forming plate rather than a forming box to form the bag shape.

This, says Soudal, minimises product snagging and allows the wrapper to operate at high speed and high efficiency on this type of product, compared with conventional flow-wrappers.

George Gordon Associates has also launched a more conventional top web flow-wrapping – the model SOM-10N – which can wrap cutlery and food service kits, but also handle a much wider range of goods.

Servo driven, the machine is capable of operating at speeds up to 400 packs a minute. Recent applications have included frozen pizzas and soap bars, both with fully automatic infeed systems.

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OPTIMA PACKAGING MACHINERY

High speed wrapping for disposables

Aimed at wet wipes, nappies and other soft disposable products, the Optima FB flow-wrapping operates at speeds up to 120 a minute – depending on stack height – and can also be equipped to add labels or plastic lids for reclosure as well as up to four further labels for product branding, promotions and pricing.

Reclosure labels or plastic lids are fixed to the film web before the forming station.

The machine operates in conventional fashion for handling mono polyethylene films, using impulse sealing for the cross seals, but in place of the conventional rollers employed for the fin seal employs a hot air jet and a pair of rubber rollers. This, says Optima provides a more reliable longitudinal seal for polyethylene films.

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RECORD PACKAGING SYSTEMS

Upgraded series features touch screen control

Record Packaging's series of flow-wrappers has been upgraded, with stainless steel construction as standard together with Siemens touch screen controls on all electronic machines.

FLOW-WRAPPING

The new generation, stainless steel Scorpion offers entry-level flow-wrapping while there is now also a multi drive version of the machine, which is PC controlled.

As well as jaw dwell and bag length, infeed phasing is also controllable, with up to 50 product settings held in memory. No product-no bag and misplaced product detection are now available for the first time while there is also an inverted version for delicate or wet products, fresh produce and multiple product packing, such as airline cutlery.

Aimed at the medium volume market, the new generation Panda runs at speeds up to 300 packs a minute and is equipped with Siemens electronic controls and touch screen allowing set-up details for 30 products to be held in memory for size change. Maximum film width is 720mm.

The Record Jaguar is for high volume, single and multi-product applications. It has electronic controls, with touch screen operation and 99 product memory for size change. No product - no bag and misplaced product detection is standard.

The machine is also available fitted with D-cam motion long dwell sealing jaws to give high

integrity seals for gas flushed products and is said to be capable of handling most bakery pack sizes at speeds up to 100 a minute.

For the dairy and cheese industry the Jaguar Superseal is now available in a standard version for manual feeding at speeds up to 100 a minute and the HS version with automatic feeding for up to 300 packs a minute.

For fresh produce there is the new Record Gazzella Top Seal, an inverted flow-wrapper for variable size items such as celery, leeks, peppers, asparagus, and lettuce.

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SELO-BOLLANS

Box motion jaws give hermetic seals at 250/min

The Japanese-built Omori S5000A-BXH flow-wrapper, introduced by UK representative Selo-Bollans, employs box motion sealing jaws that move with the film to provide hermetic seals at speeds up to 250 packs a minute on a wide

range of barrier packaging materials. Applications include food, medical devices and pharmaceuticals.

Selo-Bollans says that a key element in achieving high quality sealing is Omori's PerfectTension system, which monitors the diameter of the film reel and adjusts the film drive speed to match, ensuring constant tension from reel to sealers. This, explains the company, eliminates tracking issues and ensures accurate print registration and coding.

The S5000A-BXH is built on a cantilever basis with all components mounted to one common rigid chassis. This is claimed to eliminate film wander and tighten up tolerances in film width, allowing substantial savings to be achieved.

Selo-Bollans also says that the open structure is easy to clean and verify for product prior to changeover.

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For full details of all PPMA members able to supply flow-wrapping machinery, consult the PPMA machinery finder service, tel: 020 8773 8111, or visit www.ppma.co.uk