

Modular machines ring the changes

One of the more obvious trends in the design of vertical form-fill-seal machines since their invention some 70 years ago has been the shift away from reciprocating cross seal jaws towards cross seal jaws that operate from a fixed position. So it is something of a surprise to see reciprocating cross seal jaws being used again in new machines at all, let alone for high-speed applications.

All the early **vertical form-fill-seal machines** used a reciprocating cross seal jaw assembly which performed two functions: pulling off the measured length of film from the reel and forming both the top and bottom cross seals to produce the classic pillow pack. These machines were used extensively in most industries where they worked efficiently and reliably.

So this begs the question, why did reciprocating jaw machines disappear originally and why are reciprocating jaw mechanisms now making a comeback?

The classic reciprocating jaw machines dominated the market right up to the 1980s, but started to be replaced by machines using belts to draw down the film, for three main reasons.

Draw down belt machines can produce long bags with no need to be very tall; they can be fitted with a series of attachments to produce gusseted and block bottom style packs; and they avoid the problem on the reciprocating machines of the bag being pulled flat as it is being formed, which makes it difficult to fill lightweight products.

So why have machine builders looked again at reciprocating jaw mechanisms?

The challenge for all vertical form-fill-seal machine manufacturers at the moment is to get machines to work faster, to match the 120-180 packs a minute capability of modern multihead weighers. Fixed position rotary jaw machines can match these speeds on light products such as crisps, but for heavier products and films requiring a long sealing time, a simple rotary motion

Since market pressures increasingly demand a variety of bag styles for the same product, machine builders are turning to modular designs to provide a variety of packs from the same machine. But first, why are reciprocating jaws staging a comeback? Martin Keay reports.

which produces only a very short sealing time is not enough.

However, one of the great advantages of the reciprocating cross seal jaw is that it gives a long sealing time and, when combined with a draw down belt mechanism for the film feed, produces machines that have the advantages of both types of machine and the ability to create heavy weight packs at high speed.

Travelling with the film

Reciprocating jaw motion is at the heart of Sandiacre Packaging Machinery's new TG350 RC machine. Cross seal jaws that travel with the film as it moves at a constant speed allow the machine to produce high integrity seals at high speed. The design also allows polyethylene as well as heat-sealable materials to be handled, using either hot air or rotary band mechanisms to produce the back seal.

Aimed initially at the salad and frozen food markets, the TG350 RC machine is also finding applications packing potatoes for leading UK supermarkets. The reciprocating sealing jaw mechanism allows the machine to run at high speed with both large volume products such as prepared salads and high density products such as frozen vegetables, even when packed in polyethylene film.

For example, 200 x 300mm pillow packs containing 100g of salad can be packed at a rate of 100 a minute and 300 x 400mm pillow packs carrying 1kg of frozen produce can be produced at a rate of 120 a minute.

Ilapak's Vegatronic 3000 vertical form-fill-seal machine also incorporates cross seal jaws that reciprocate and move at the same speed as the film during the sealing cycle.

Indeed, the Vegatronic 3000 has recently been selected by Ryecroft Foods, part of the Weetabix Group, for its Ashton-under-Lyne factory to pack malted wheat and bran stick cereals, which are sold as own label products by multiple retailers. Ryecroft is also using three Vegatronic 2000 machines to pack cereal products at its factory in Hastings.

At Ashton-under-Lyne, the Vegatronic 3000 is making and filling hdpe bags in a variety of sizes, achieving speeds of over 40 a minute for the 500g pack.

The machine has a constant film feed system and its box motion jaws travel with the film, increasing seal dwell time and improving film tracking. In addition, the jaw sealing time is programmable giving greater sealing control and further improving efficiency. The servo driven horizontal sealing jaws also cushion the products' drop, making it particularly suitable for cereals and other delicate products.

Quick reel changes

A further benefit of the Ilapak machine is its cantilevered pneumatically expandable unwind shaft for the film reel, which allows changeovers to be carried out quickly and efficiently.

According to Dave Lee, factory manager at Ashton-under-Lyne, the Vegatronic 3000 has allowed Ryecroft to improve efficiency and pro-



Reciprocating jaws: Sandiacre's new TG350 RC is aimed initially at the salad and frozen food markets



Reciprocating jaws: Ilapak Vegatronic 3000 has programmable sealing times

ductivity significantly. He comments: "Our production line operators are very pleased with the machine. It is simple to operate using a colour touch screen and pack changeovers are quick, reducing machine downtime."

Rovema's continuous motion vertical form-fill-seal machine is the VPK, which incorporates servo-driven cross seal jaws that describe a D motion and match the speed of the constantly moving film during the sealing time.

Automatic splicing

The company's latest accessory for the VPK and other machines in the range is an automatic reel splicing facility. This mechanism, which can be directly integrated into new packaging machines or retrofitted to existing equipment, changes reels without stopping production, at film feed rates up to 30 metres a minute.

When operating in normal production the splicer will be automatically activated when the end of a film reel is sensed. Alternatively it is possible to switch between reels which might, for example, be printed for different customers or in different languages, at the touch of a button, since the splicing procedure can be activated at any time during normal production.

During the reel changeover, print is registered to within $\pm 1.5\text{mm}$ so that no film is wasted. Only a single bag, containing the splice, needs to be rejected, and this can be carried out automatically. The splicer can handle mono and multilayer material up to 150 micron, in reel widths up to 560mm and reel diameters up to 450mm.

Automatic splicing has a number of benefits. The production process is kept running and so there is no need for other machines to absorb production during a manual reel change. Film wastage is minimised because there is no temptation to change a reel prematurely before it has been completely used up, and the operator's time is used more effectively because there is no need to wait around when a reel is near its end.

Belgian snack foods manufacturer Roger & Roger has recently installed five TNA Robag 2Ci continuous motion vertical form-fill-seal machines at its Mouscron factory. Built two years ago, the Mouscron potato chip plant now owns a total of ten TNA Robag 2Ci machines and there are plans to increase packing capacity further, later this year.

The continuous motion Robag machines feature rotary cross sealing jaws and a patented stripper mechanism which allow the machine to operate at speeds of up to 160 bags a minute. Roger & Roger's product line includes packs

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ranging from small 25g bags up to large family sized bags, but TNA was able to offer a packaging solution that meets all the company's requirements by using both the TNA 414 SNX multihead weigher, as well as the larger TNA 514 SNX multihead weigher.

"Since the installation of our TNA packaging systems, costly maintenance and downtime have been eliminated", says Roger & Roger's production manager Walter Dalle.

However, the design of vertical form-fill-seal machines is not just about speed. Market pressures are such that many products have to be packed in a variety of pack sizes and pack styles such as small individual servings, bulk packs with carry handles, stand-up packs for maximum shelf impact, and packs with easy open and reclosure features for added convenience.

Separate machines needed

In the past, every one of these pack styles would have needed to be produced on a separate machine specially equipped for the job. However, one of the benefits of the current generation of modular, servo driven machines is that it is often possible to produce several pack styles on the same piece of equipment.

For instance, the Rovema VPK 360 is now available with the cross sealing jaw mechanism mounted on a turntable, which can be rotated from 0 to 92deg. This turntable allows a single machine to produce several different pack styles, by altering the position of the cross seal mechanism. So a single VPK 360 machine can be configured to produce conventional pillow packs, block bottom bags with centre back seals and also block bottom bags with offset long seals. Other pack styles include stand-up bags with reclosable tops and gusseted bags.

Stand-up bags with fin seal corners are becoming increasingly popular, not only because of their strength and attractive appearance, but also because they avoid the problem of a back seal disturbing the pack's graphics on the back panel. The back or long seal of a conventional fin seal pack can be moved to one corner fin of the pack, so ensuring that all four panels are available for graphics.

Machines capable of producing corner fin seal bags have been available for many years, but in the past these machines could only produce one style of pack. However, the new generation of fin seal machines use modular construction techniques that allow them to produce fin seal packs and other styles of pack on the same machine.

Bosch launched its SVE 2510 QR machine for

corner sealing at Interpack in April. The width of the corner seals can be set as low as 2mm to minimise materials usage and can be varied by the customer up to 8mm for optimum fin strength.

A continuous motion machine, the SVE 2510 QR is capable of producing corner sealed bags while maintaining a very low machine height, which has the advantage of reducing risk of product breakage and makes installation easier in existing production lines. The machine can be changed easily between corner sealed bags and pillow, gusseted or stand-up bags and has an output up to 80 a minute, which is up to 50 per cent more than intermittent motion machines.

Sandiacre's Quad Pack was launched at last year's PPMA Show. The fin width of the Quad Pack can be adjusted between 4mm and 12mm while the longitudinal seal can be placed at any position on the back face of the pack or integrated into one of the fins. As an alternative, fins can be made on just two corners of the bag giving extra rigidity and shelf appeal to the front face.

The equipment to produce Sandiacre's Quad Pack is available as a retrofit to existing TG250, TG320 and TG400 intermittent motion machines or as a standard option on all of Sandiacre's current range of new machines.

Rovema has been equipping machines to produce its Stabulo Seal fin seal pack for many years and offers the pack style for a wide range of pack sizes. However, in the past, the use of a rectangular forming tube to produce the pack has restricted the cross sectional area available for filling product into the bag.

To solve this problem, Rovema has developed round forming tubes for Stabulo bags, giving the maximum cross section for filling a given bag size. Round tubes have allowed production speeds to be increased to those achievable with a pillow pack while reducing the incidence of product bridging in the filling tube.

Round forming tubes also have advantages for powdered products, because a larger diameter auger can be used to dose the powder, so increasing production speeds and reducing product breakage.

Two separate areas

Fin seal packs can also be produced on the RS20 from Italian manufacturer ICA, represented in the UK by Fords Packaging Systems.

This machine is unusual because it has two separate areas for making and filling the bag, so avoiding problems caused by product being included in the seals. The RS20 can also be equipped to produce very precise stand-up bags



High speed: TNA 2Ci continuous motion bagger will run at speeds up to 160 a minute

using 'K' seals in the bottom gusset area to stop product penetrating into the folds of the bottom of the bag.

Another strong market trend is toward bags with reclosable zip devices. Here again modular construction using servo drive motors is allowing manufacturers to offer zip applicators as add-ons to standard machines which can also be used to produce other styles of pack.

The Bosch SVK 3600 P machine gives customers the option of applying or not applying reclosure zips to a range of different pack styles. The Bosch Trans-Zip applicator applies a zipper-profile on to the flat film before the bag is formed and the ends of the zip are ultrasonically sealed to improve operation of the zipper. Output of the machines is 30 to 80 bags a minute when applying zips.

Sandiacre's new transverse zip applicator, which can operate at up to 60 packs a minute, is available both with new machines and as a retrofit package. Changeover time from zip appli-



Zipper bag machine: Bosch SVK 3600 P can also produce standard pillow packs



Stiffer corners: Sandiacre Quad Pack system makes stand-up bags more rigid

cation to standard pillow pack production has been significantly reduced, as it is no longer necessary to change forming sets or reposition sealing jaws.

The servo controlled applicator comprises a combined zip profile metering unit and welding unit which sits neatly at the rear of the forming shoulder. It can accurately position a metered length of zip profile across the packaging film where it is tack welded into position.

The Inno-Tech EVO range of vertical form-fill-

seal machines, which is being marketed by Ward Bekker, can also be equipped to handle zip closures. The EVO features servo drive, automatic film tracking, bag length control for unprinted materials and a touch screen control panel.

Compact zipper module

US manufacturer Triangle, represented in the UK by Ultracpac, has announced a new compact zipper attachment system for its Advantage vertical form-fill-seal machines, called the Advantage T-Zip. The combination runs with all films, including ldpe, making reclosable pillow, gusseted and flat bottom bag styles from web widths up to 800mm. The host machine can revert in minutes to producing standard bags.

The T-Zip module includes an Allen-Bradley PLC controller for the applicator, while the complete bagging system is run by Triangle's Selectech touchscreen computer control or an optional Allen Bradley PLC.

PFM is just about to carry out the first UK installation of its Vetta model, which the company claims to be one of the most versatile machines on the market. It will be producing the latest style EasyPack easy peel open and reclosable bag for one of the UK's largest food groups.

The Vetta is an intermittent motion, fully servo driven, vertical form-fill-seal machine able to produce around 20 different styles of pack and incorporates end seal jaws that can be rotated horizontally, to produce the necessary offset back seal for the three-side seal EasyPack bag.

The EasyPack is hermetically sealed, making it

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suitable for modified atmosphere applications, but can be opened simply, without the need for cutting or tearing, by peeling back a flap. When this flap is pulled back, a waxed paper strip is revealed. When the paper is pulled away it uncovers a strip of adhesive, which can be used by the consumer to reclose the pack.

The EasyPack can be punched with a Euroslot for hanging display in store or produced with a gusset in the base as a stand-up bag.

An easy-open reclosure system that uses a low-cost filmic label, and can easily provide full or partial width openings to suit the product, is now available for the Fuji range of vertical form-fill-seal bagging machines, marketed in the UK by Paramount Packaging Systems. It was demonstrated for the first time at Interpack in April.

Shown mounted on a Fuji FW-77 vertical bagger, the Re-Seal It system allows bags of snacks, pasta, confectionery and other loose or free-flowing products such as tea and coffee to be opened and then reclosed, avoiding spillage while reducing take-up of moisture and loss of flavour.

"Unlike other methods of reclosing a form-fill-seal pack, the Re-Seal It system does not involve the expense of plastic profile and, most important in terms of consumer safety, can be opened without scissors or knives," points out Paramount director John Roberts. "A further benefit is that the aperture can be a full width envelope style flap at the top of the front face, typically for snacks, or simply at the corner for pouring, which uses even less material."

Die-cutting a flap

The Re-Seal It system operates with conventional wrapping film, first die-cutting it to produce a flap, held in place by small notches. A filmic label with peelable adhesive is then applied over the flap and sealed into place.

To access the pack, consumers simply peel back the label, which carries the flap with it. A small non-adhesive area at one end of the label provides a pull point. To reclose the pack, the label is wiped back into place, held by the peelable adhesive.

The Fuji FW-77 bagger offers speeds up to 100 packs a minute, with a bag size range of 70-250mm wide and 50-350mm long. The machine employs vacuum belts to give consistent film draw down for uniform bag length, while optional equipment includes a hole punch, gusseting device and gas flushing system.

Gainsborough Engineering has recently supplied snack manufacturer Tyrels Court with a



Using the EasyPack bags: For initial entry the flap is peeled back (1) and the bag opened (2). The waxed paper strip is removed (3), revealing a further strip of peelable adhesive for reclosing the bag after use

complete crisp packing line, from taking control of the crisps leaving the fryers through to inspection, flavouring, weighing, in-line metal detection and vertical form-fill-seal machines.

The heart of the system is the stainless steel GV2K2 vertical form-fill-seal machine which can pack bags at speeds up to 80 a minute and is capable of producing bags up to 200mm wide and 350mm long. The PLC automatically monitors jaw obstructions, film breakage, print registration, packaging material run out and safety guard circuits.

Modular design basis

All Gainsborough vertical form-fill-seal machines are designed on a modular basis so that it is easy to retrofit any ancillary equipment for block bottoms, carry handles and zipper application, along with the ability to offer dual laminate and polyethylene sealing.

Wright Machinery has launched a compact continuous motion form-fill-seal bagging machine aimed at handling dusty, lightweight and irregular shaped products, particularly for the food industry.

The Pacwright 100 operates at speeds up to 100 bags a minute and employs a positive strip-

ping action to remove product from the seal area, for improved pack integrity, while tube closing rollers above the sealing jaws reduce air in the finished bag, to give better appearance and higher density for end-of-line case-packing.

In addition, the forming tube of the machine is cut-away at the rear face, preventing risk of jamming by irregular shaped products, or those that tend to agglomerate.

Servo-motor driven, the Pacwright 100 uses a newly developed vacuum-belt film draw-down system. This, says Wright Machinery, contributes to improved film tracking accuracy for print registration and can allow fin or overlap seal allowances to be reduced for materials savings. There is also a film unwind that adjusts laterally, for ease and accuracy at both initial set-up and reel changeover.

The Pacwright 100 is able to produce bags 50-380mm long and 50-230mm wide and occupies a footprint of just 2405 x 650mm wide. A twin tube version, for output up to 200 bags a minute, is also available.

US manufacturer Triangle, represented by Ultracpac, has recently announced a new coffee packing line said to reduce costs and accelerate the 'grind-to-package' cycle.

The Advantage form-fill-seal machine, equipped with an auger filler, also incorporates an applicator that welds a polyethylene valve to the film web. This valve releases the gas generated by freshly ground coffee, so allowing it to be packed immediately in laminate block bottom bags. Once pressure in the bag falls, the valve closes to preserve freshness.

Ancholme Machinery recently installed one of its AB 330 vertical form-fill-seal machines at TS Foods in Belfast, to pack frozen stuffing mix,

sausages and beef burgers into bags varying in weight from 400g to 2.5kg. The machine is integrated with a mobile Bilwinco multi-head weigher which, because of the need for frequent cleaning between product runs, can be easily separated from the bagger for off-line cleaning.

Reject weight chute

The AB 330 incorporates a reject chute, inside the machine guards next to the forming tube, so that any reject weights can be released from the weigher without going into a bag. Reject weighments are caught in a catch pan for return to the production line, minimising waste bags and also allowing the user to empty the weigher directly down the chute at the end of a production run.

Ulma has recently launched a new range of vertical form-fill-seal machines called Niagara, which are available from Wrapid Packaging Systems. There are two models, the Niagara 280 and the Niagara 380 both of which can produce up to 80 packs a minute. The Niagara 380 model can produce bags with a maximum flat bag width of 380mm.

The latest vertical form-fill-seal machine to be



Bagger/counter: Willi W18 with Comcount bowl feeder counter

launched by Swiss manufacturer Willi Maschinenbau is the entry level W18, a compact unit designed specifically to handle hardware items at speeds up to 50 bags a minute.

The Willi W18 can be supplied with an inclined filling tube, which is of great assistance when packing heavy or delicate parts. Sliding products down an inclined forming tube, rather than subjecting them to a vertical drop, minimises damage both to the product and to the pack seals. Willi machines are supplied in the UK by



Multi-choice closing: Rovema SBS allows users to choose from 39 closure styles

Comcount together with their counting systems.

While vertical form-fill-seal machines can produce packs with gusseted or block bottoms, separate equipment is required to produce a pack with a flat, folded down top.

Rovema's new modular design approach is not confined to its vertical form-fill-seal machines. The Rovema SBS pack closing system is also modular, allowing customers to choose from 39 different closure styles, but safe in the knowledge that if a different closure is required in the future this can be added to the machine.

In a typical application the SBS unit will take filled but unclosed packs from a vertical form-fill-seal machine, fold down the top of the pack and then apply a closure device. The most common are adhesive tape, self-adhesive labels and tin-ties, but many other finishing possibilities are also available, allowing customers to produce packs with a distinctive appearance.

Up to three different closure options can be incorporated into one SBS machine and they can be turned on or off as production demands. One or two bagging machines can be attached to the SBS unit which has a maximum capability of 120 packs a minute.

Italian manufacturer ICA's machine for brick packs is the HF100, which is capable of producing up to 100 packs a minute and can be supplied to use either kraft paper or heat-sealable

film laminates. The HF100 includes two filling stations, which provide a bulk fill followed by a checkweigher-linked top-up to ensure maximum accuracy.

Mike Dormer, sales director of Fords Packaging Systems, ICA's UK distributor, says that using kraft paper instead of film or laminate, for products such as dry cereals and rice, where no barrier to odour or moisture is required, allows materials costs to be reduced significantly.

Wolf Verpackungsmaschinen, represented in the UK by Engelmann & Buckham, also makes a bag top closing machine. The KVM is capable of operating at up to 80 packs a minute and can apply adhesive tape, self-adhesive labels and twist-tie closures.

Pre-made preference

Pre-made bags are still the preferred packaging choice for some products. Pre-made bags are available in many different designs and packaging material types, ranging from plain paper through to complex laminates, many of which cannot be run on vertical form-fill-seal machines.

The machinery options for pre-made bags of this sort are automatic bag closing machines and fully automatic machines that erect, fill and close pre-made bags.

For example, Soudal offers equipment just to close or alternatively fill and close such bags. For closing alone there is the German Siebler & Göring range of in-line machines for folded top bags which produce either a gable top or parcel type: a flat top style of bag with the folds being secured by gluing, hot air sealing or a self adhesive label. Filled bags can be fed to the closer

manually, transferred to the closer from an automatic bag presenting and filling machine or from a vertical form-fill-seal machine.

For filling & closing SOS type bags, Soudal offers machines from the Italian company Paglierani. Rotary and in-line designs are available which can operate at speeds up to 100 bags a minute depending on product and bag size. The machines are aimed very much at flour and sugar although further products handled include pulses, rice, salt, and bakery items.

Big bag performance

Modular machine construction is also improving the flexibility of machines designed for 25kg and other large bags.

Cytec Industries UK has recently installed a Sandiacre TG600L vertical form-fill-seal machine at its chemical plant in Bradford, West Yorkshire, to pack dry water soluble polyacrylamides and flocculants.

The machine can form and fill bags with a flat bag width of up to 600mm and is the third Sandiacre bagger to be installed by Cytec, replacing the company's original 25kg pre-formed sack operation. Indeed, future rises in demand are well within the scope of the TG600-L machines, which are currently operating well below their maximum design specification of 30 sacks a minute.

Aetna UK now represents Esse Gi, an Italian company that makes a range of large scale vertical form-fill-seal machines for bags of 5kg to 50kg. Designed specifically for products such as compost, sawdust, straw and wood chips, the Esse Gi machines can be delivered complete with wood chipping machines, feeders and balers.

Webster Griffin has recently delivered a B&C CV25 bagging system to pack 25kg plastic sacks of molassed horse feed at 725 bags an hour and pelletised cattle feed at 900 bags an hour. The same machine will also produce 5kg, 10kg and 15kg packs with carry handles.

Packing animal feed into plastic sacks, which is popular in Continental Europe, is not common in the UK although Webster Griffin anticipates that this will change as plastic materials that feel like paper become available.

Binder and Co of Austria makes the MK Series of vertical form-fill-seal machines that can produce polyethylene film packs varying from 4 to 80 litres. W J Murray Engineering, Binder's UK agent, reports that there are ten MK machines in the UK packing various food products, salt, phosphates, plastic granules and cat litter.

However, for many products and applications,

the complexity and expense of a vertical form-fill-seal machine cannot be justified. For low volume applications there are several alternatives including machines that simply seal a previously filled bag to machines that make bags using lay-flat tubing or pre-made bags on a reel.

For example, Xertrex, a stationery manufacturer based in Illinois, USA, has recently purchased a Sprint Autobag machine, which fills and seals pre-made bags supplied on a reel, from Automated Packaging Systems.

Xertrex produces a range of indexing and labelling tabs under the Tabbies brand name and these were previously packed, by hand, in 10s, 20s and 50s into plain plastic bags.

Rich Stanley from Xertrex explains: "Our problems were two-fold. Firstly the bagging process was labour intensive and it was creating a bottleneck. Secondly, the pack was plain and unsuitable for the retail market. We were previously using L-sealing machines that were slow and inflexible and produced a ragged looking pack."

The Sprint machine uses a friction feeder to separate and count the products into the required quantities and to fire them vertically into the bags at up to 56 bags minute, against the 12 bags a minute of the previous system. When required, the Sprint can also be used with additional manual operators.

The machine is equipped with a thermal transfer printer which prints additional information such as product codes and stock numbers on to the bags during the bagging process.

Formed from layflat tubing

In recent months, Erapa (UK) has installed a number of Semplicita Bag Plus 400 form-fill-seal machines, for which the company is UK agent.

The Semplicita machine uses layflat polyethylene tubing, which can be plain or printed. A horizontal base seal is made to form a bag, which is mechanically opened for filling, and then top sealed. The machine includes a number of standard features and options, which make it particularly versatile for a range of markets, including DIY, automotive and textile products.

A control system with a touch screen can be pre-programmed ready to run several different products. This facility is particularly useful when packing products of different lengths into bags of the same width, because size changes can be made with a single touch of the screen. To produce a bag of a different width, the film reel has to be changed, but Erapa claims this can be achieved in seconds.

For smaller products requiring higher speeds,

a twin lane option is available, with two rolls of layflat tubing running simultaneously, forming, filling and sealing the bags in tandem. However, with a maximum bag width of 400mm, length up to 2 metres and a seal depth of 2.5 mm, the Semplicita unit can also be used for bagging larger or irregular shaped products such as rolls of cable, radio aerials, long handled tools or window blinds.

For products marketed on a hanging display, a third weld can be introduced, incorporating a punched through Euroslot.

Recycling parts

Finally, Barry-Wehmiller Europe is now building the Hayssen Ultima 40E vertical form-fill-seal machine using recycled parts. Non-wear parts such as machine frames from old machines, which would otherwise be scrapped, are being combined with new components and state of the art control systems to produce new machines at a very competitive price.

For example, the company is offering a full weighing system, consisting of an elevator, linear weigher and Ultima bagger, for under £50,000. Each machine is finished to new machine standards and carries a 12 month guarantee. ■

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