

# Flow-wrapping looks to the Reclosure options

TECHNIQUES FOR INCLUDING RECLOSABLE FEATURES IN PACKS PRODUCED ON HORIZONTAL FORM-FILL-SEAL MACHINES ARE NOW BECOMING MORE COMMON, SOME 20 YEARS AFTER THE CONCEPT WAS FIRST INTRODUCED ON VERTICAL MACHINES.

**W**hen it comes to incorporating reclosable features, horizontal flow-wrapping has traditionally had to play catch-up with vertical bagging. Now, many technologies – such as zippers and Amcor's EasyPack – are available in both horizontal and vertical formats. And increasingly, additional reclose options are being developed which are only suitable for use on flow-wrapping machinery.

Despite the tendency for many in the industry to talk about "resealable" rather than "reclosable" packs, few systems, if any, genuinely recreate the quality of the original seal.

But for the best quality closure, and therefore the optimum product protection, zipper systems have established a significant presence over recent years, particularly in the food industry. Overall pack and machine developments have been helped by improvements – and a broadening range – in the zipper profiles themselves.

Sigpack Systems, part of the Bosch Group, underlines the rapid quality improvements since the company first integrated a zipper into one of its flow-wrapping lines for the North American market some seven years ago.

According to materials specialist Norbert Hoechst, Sigpack has tended to work with Zip-Pak profiles. These are among the softest and most flexible profiles on the market, and so easier to run through a machine, he says.

Typically combining either nylon or polyester and polyethylene, they are most commonly used on cheese-wrapping applications. This seems to be one of the key categories internationally where consumers appreciate the benefits of reclosability.

Mr Hoechst goes on: "We run the zipper in down the long seal. We have projected how this could be done across the web and could offer this, but it would be an inefficient way of applying reclosability."

Product manager for flow-wrapping Urs



**Short edge zipper:** Fuji has introduced an applicator for its latest Alpha 6 machines

Schweizer adds: "Application length-wise can be carried out as a continuous motion operation, while application across the web would be intermittent motion. That's an important distinction when you're operating to high production targets." The installation cost of the equipment would be higher, he predicts, for a less efficient line.

## Speeds up to 200 a minute

For example, the zippers on packs of Dairy Crest Cathedral City cheese are applied on a Sigpack HSF machine running at speeds up to 200ppm, applying a three-side seal, including a fin-seal. This is the speed that the same machine would achieve without a zipper, says Mr Schweizer.

Mr Hoechst emphasises that in this type of application Sigpack machines do not seal through or across the zipper. "We cut the zipper so it is shorter than the pack, and we seal

around it. This makes the handling more complex, but the final quality is better."

However, a cross-web zipper applicator that allows flow-wraps to be produced with the zipper across the short edge of the bag, rather than the long edge as usual, has been announced by Paramount Packaging, which represents Japanese flow-wrapper manufacturer Fuji.

## Reduce zipper cost

Available for certain models in Fuji's latest Alpha 6 range of machines, the new applicator is said to reduce the zipper material cost for a whole variety of goods that can only be packed horizontally, usually in trays – such as cakes and some meat and dairy products – and require a reclosable bag for additional larder life.

In addition, Paramount points out the system also keeps the nylon zipper material completely within the bag, avoiding excess material in the transverse seal area and any consequent risk of poor seal quality.

"The hardness of nylon zipper profile and its thickness makes it a difficult material to include reliably in a transverse seal, and packs may be liable to leakage," points out John Roberts at Paramount Packaging.

Instead, the Fuji applicator system takes zipper material from a reel, cuts it to a length just slightly less than pack width, and tack welds the profile at 90 deg to the centre of the film web, immediately after the unwind.

This puts the zipper across the width of the pack once the goods are loaded and the web formed and sealed longitudinally. As the transverse seal is made, the zipper profiles are simply sealed to the inner faces of the bag, just below the permanent seal.

Barry-Wehmler company Hayssen Europe has owned Sandiacre in the UK for over a year now. When it comes to flow-wrapping, the newly-created HayssenSandiacre business

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brings together the US manufacturer's RT range and the Rose Forgrove range previously acquired by Sandiacre. And when it comes to zipper systems, it has its own views about how best to guarantee quality.

HayssenSandiacre new machinery sales manager Shaun Toms was formerly with Zip-Pak and has a firm grasp of current – and future – applications of zipper technology. He agrees that a profile can be fed in and sealed across the web, but adds that this has never been done on an RT machine. In any case, he says, the long side seal in the C-fold pack formed on the Hayssen machines actually becomes the 'top' of the pack.

Like Sigpack, Mr Toms has his doubts about cross-web zipper application. In the cross-web module offered by Zip-Pak, he says, the operation is made more complex by the fact that the profile is first tacked in place at both ends and only subsequently sealed to the base web by the jaws. On a single-die sealing head, dwell-time would be very limited, he says, while on a rotary multi-die system a customer would be unlikely to want to mount special dies on each face of the assembly.

### Running continuously

But unlike Sigpack, HayssenSandiacre's RT machine runs the zipper continuously through the length of the pack and seals through it rather than around it. "It's less problematic because there is less chance of it going out of register, and it's also easier to set up," Mr Toms argues. He goes on to explain that consumers are more likely to have trouble marrying the two sides of a zipper applied intermittently, since there will be a slight gap at each end.

When it comes to this type of reclose technology, HayssenSandiacre has seen rapid improvements in the last few years, not only in machine reliability, but also in materials performance.

"The zipper itself can be specified with different sealant layers which require shorter dwell times, and the substrate can incorporate metal-locene-based films for a better or faster seal," Mr Toms reports. Softer polymer blends in the zipper can also make them easier to seal through.

The use of 'floating' sealing heads will usually provide better results, he adds. This way, they find their own position and more readily even out pressure along the seal.

HayssenSandiacre has RT machines incorporating a zipper running at speeds up to 200 packs a minute on small items. On average

sized packs of cheese, speeds would be up to around 160 a minute, although this depends more on peripheral operations such as product cutting, says the company.

PFM picks up HayssenSandiacre's distinction between single-jaw and multi-jaw machines. Its BG2800 machines equipped with multi-die sealing have sufficient dwell time to seal through the zipper, which is applied in a continuous format, says sales and operations director Chris Bolton. This is not the case with a single-jaw machine.

### Shorter than the bag

Zippers can be applied intermittently, cut shorter than the length of the bag, with the seals then applied around them, says PFM. There may be aesthetic reasons why a customer would prefer to seal around rather than through the zipper. And Mr Bolton argues: "A continuous zip can create more creases, which in turn can create greater potential for leakers." But current technology means that intermittent application of the zip will result in machine speed reductions of between 5 and 10 per cent.

Mr Bolton explains: "We are running tests on a 400g cheese portion which we can wrap with a continuous zipper at speeds of 150 a minute in workshop conditions. We are trying to see if we can raise intermittent application to the same speed."

PFM does offer one example of cross-web zipper application. Incorporated into its Mistral machine, it is aimed at bigger products such as breads and ethnic breads. Speeds are lower than on standard, smaller-unit zipper application, reaching 60 or 80 packs a minute, says the company.

Slider, rather than press-to-close zippers may have been around for several years, without making a breakthrough in in-line application, but Shaun Toms at HayssenSandiacre believes their time will come. "I'm pretty convinced this is the way forward," he says, while admitting that application is more complex.

### Improve performance

The zipper profile itself is bulkier, and the sliders have to be fed in, typically from a bowl feeder, at regular intervals and applied on-line. So speeds are currently lower than for standard zipper application, but machinery and materials suppliers are working to improve performance.

Mr Toms says: "In the UK, you can see slider packs on some petfood products, but these are



Slider bags: Zip-Pak bags from Hayssen equipment

generally on pre-made bags. To do this more economically, you need to do it in-line. There are people in the US doing this, and there was an early system used in France on cheese. Once one person goes for it here, the others will follow."

Adhesive-based systems are the other commonly-used method of providing reclosability. Amcor's EasyPack technology combines easy opening along a flap with a peelable tape higher inside the same flap. This tape reveals an adhesive strip for reclosing the pack. Amcor acquired the system from Danisco, and holds

## Italian range caters for 1000 plus packs a minute

A range of servo-controlled flow-wrappers and product handling systems – built on a balcony basis – to cater for speeds up to 1000 items a minute is now available from Hansel UK, representative of the Italian manufacturer OPM.

Principal machines in the OPM-Jointech range are the J-200 capable of speeds up to 300 packs a minute, the J-350 capable of up to 500 a minute and the J-600 for speeds in excess of 1000 a minute. These can be coupled to OPM up-stream product handling, buffer storage and distribution, to downstream multi-pack collation and secondary wrapping.

Rotary long dwell or box motion sealing jaw arrangements are available depending on the wrapping material and speeds required.



**Reclose for cheese:** Zipper packs for Cathedral City brand run at 200 a minute on a Sigpack HSF machine

the patent on wrapping materials.

Although better-known in the UK as a vertical system, EasyPack was originally applied on flow-wrapping lines, as Chris Bolton at PFM points out. In mainland Europe, horizontal systems include those at Lactalis, France (Président cheeses). Speed is a limitation, says PFM, which puts output on typical cheese packs at up to 100 a minute. The same BG2800 machine which can apply zippers inline can be used to run EasyPack.

For Sigpack Systems, reclosability and easy-opening are two aspects of convenience which

cannot really be talked about in isolation. From its perspective, this means that an existing easy-open system such as its Pull Pack technology also becomes an opportunity for incorporating a reclose facility.

#### Adding a fold

Pull Pack operates as an additional module on the flow-wrapping machine, perforating the tubular wrapping film, and then adding a fold to protect that perforation. On a typical coldseal line, says Sigpack, this can operate at speeds up to 80 metres a minute. Pull Pack is seen as

being especially suitable for potentially messy products such as chocolate and ice cream.

Clearly, with portion packs of this sort, reclosability is not a priority. But Sigpack's Norbert Hoecshst explains: "It can be used with multiple items such as feminine hygiene products or dishwasher detergent tablets. In this case, there is no reason why more than one coldseal adhesive couldn't be applied with differing grades of tackiness."

Sigpack stresses that, for now, this reclose option on Pull Pack is only a theoretical capability, but one that could probably be offered at the same line speeds as standard Pull Pack.

#### Peel-seal adhesive

The use of 'peel-seal' adhesives is becoming common in some sectors. At least one major European confectionery brand is now using advertising to highlight this fairly simple type of reclose option on 100g and 300g chocolate tablets. The adhesive applied to the long and short seals allows them to be stuck down again when only a part of the tablet has been consumed. The same system is being run by the same multinational brand-owner in both Central Europe and Scandinavia on Sigpack machines, says the equipment company.

Of course, several of the simplest approaches to reclosability use a straightforward pressure-sensitive label. PFM has its own patented system, Pocket Bag, which runs on the company's

damage and allowing elevated speed.

During the wrapping process the biscuits are supported through the wrapping material by flighted side belts, to prevent them toppling over. Further systems to maintain product stability include flexible, flightless side support belts or flighted side chains passing through the jaws.

Another version of this machine is being used to flow wrap sliced loaves of bread, rather than using traditional pre-made bags.

OPM has also recently supplied a three leg high speed wrapping system based on J-600 machines for wrapping chocolate pralines. These are wrapped individually at 1000 pieces a minute or in twos and threes on a U-card at 500 pieces a minute.

The card is fed automatically from a reel, cut to length, placed under the product as it passes down the infeed of the wrapper and the sides folded up just prior to wrapping.

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**OPM-Jointech range:** The J-200, capable of 300 packs a minute is one of the models now available in the UK

Recent installations of OPM-Jointech units include a J-350 biscuit-on-edge system to wrap small slugs of mini-biscuits at 300 a minute.

The machine employs a twin track, flight bar infeed to convey the slugs of biscuits to a servo driven, twin head transfer station that positions

biscuits between the flights of the wrapper's infeed.

The transfer is driven by two separate servos allowing the transfer to move sideways at the same speed as the infeed flights, while pushing the slug between them, minimising product

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Scirocco flow-wrapper and combines use of standard peelable laminate along the long seal with envelope-style reclosure via a label.

"It's a cheaper method than many others, but it still provides a point of difference," says Chris Bolton. "And when you're not tied to a specific film supplier, that usually means the cost of the material is going to be lower."

The options for retro-fitting reclosability are usually quite limited, but PFM says that its relatively simple Peel-o-Bag system is popular in some cheese markets – especially in Ireland. End users simply have to change the jaws on their standard single-jaw flow-wrapper and then apply the reclose label.

Sigpack Systems offers similar label-based retrofit options. As the company's Urs Schweizer explains, such labels can either be pre-applied to the film or applied in-line with the flow-wrapper.

The thicker, typically opaque laminates used to flow-wrap baby wipes and other wet wipes and tissues are frequently combined with an aperture in the top of the film and either a reclosable label or a hinged rigid plastic lid. PFM supplies this market with its Mistral and Scirocco machines, cutting the hole and applying either the label or lid in-line.

On packs of 80 wipes, says Mr Bolton, these machines would typically wrap at speeds of 100 packs a minute.

HayssenSandiacre claims to have developed a variant on its zipper system which could potentially replace many of these dispensing and reclose systems for wipes and tissues. Shown at Chicago's PMMI Show in 2006, the machine runs a zipper into the fin seal down the back of the flow-wrap.

As Shaun Toms explains, attempts to do the same thing using a side-seal have come to nothing in the past, since compacted, moist towels cannot easily be pulled apart in that direction. "But the plastic lids currently used must be expensive and relatively slow to apply," he speculates. "A zipper down the mid seal must be more cost-effective."

Whatever the application, there will clearly be some customers that will continue to look for lower-cost adhesive-based and label systems. As film suppliers find enterprising routes to bypass competitors' patents, cheaper alternatives to proprietary systems will also be found. But the sustained effort put into zipper technology by both profile suppliers and machinery designers means that these systems will almost certainly take a larger slice of the reclosable flow-wrap market in the future. ■

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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](http://www.ppma.co.uk)



*Packing in the field: Belca compact BF50 machine*

XACT PACKAGING

## Compact unit is aimed at vegetables

The Spanish built Belca BF50 flow-wrapper introduced in the UK by Xact Prepack is a compact machine originally designed specifically for packing vegetables in the field, on trailers and rigs, so contributing to increased shelf life.

Measuring just 1860mm long, the basic model can produce packs from 30 to 420mm long and up to 150mm wide at speeds up to 65 a minute. Trays of lettuce have been a particularly popular application says Xact.

The BF50 is available with a range of sealing bar widths, a multiple sealing bar option, and a number of different feed systems to suit different applications.

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