Shorter runs demand yet more flexibility

Integrated line: *Blister packing section of the Marchesini MB430 blister packing/cartoning line*

Continued expansion in the contract and generic drug sectors has increased demand for short-run, versatile blister packing machinery, as Andrew Smith reports.

Despite the relatively expensive materials cost compared with other forms of primary pharmaceutical packaging, blister packs remain the presentation of choice for a large number of solid dose manufacturers.

Superior barrier properties, improved compliance and innate tamper-evidence are important technical advantages, while ease of use and convenience – especially when travelling – and the perception of high added value are important consumer considerations.

And from a marketing and design point of view, there is great value in having a flat carton to work with and the ability to overprint the foil so that the brand message is maintained, even when the product is removed from its secondary pack. These attributes are particularly relevant to the expanding, but highly competitive over-the-counter market where products have to fight for recognition on overcrowded display shelves.

As a result, the blister pack now enjoys some 30 per cent of the global primary pharmaceutical packaging market and growth remains steady. This should be good enough news for machinery suppliers, but in the UK and other western markets, two specific factors have further spurred demand for blister packing lines: generics and outsourcing.

Generic production is being supported by the continuing squeeze on health budgets and the glut of major products which have come off, or are soon to come off patent. Meanwhile, the contract sector is benefiting from the continuing transformation of the major players from vertically integrated companies to "virtual status", where only R&D and marketing are carried out in-house.

Blister packing has done very well from the business upswing in these sectors as the installation stories below will show. But have these moves also had an effect on the nature of the machinery in demand?

The answer, unsurprisingly, is yes and no. The general trend, uninfluenced by these market moves, is the desire for ever more GMP compliant lines where drive mechanisms are separated from packaging materials and product, servos replace mechanical drives and the overall design aids cleaning.

Flexibility the keyword

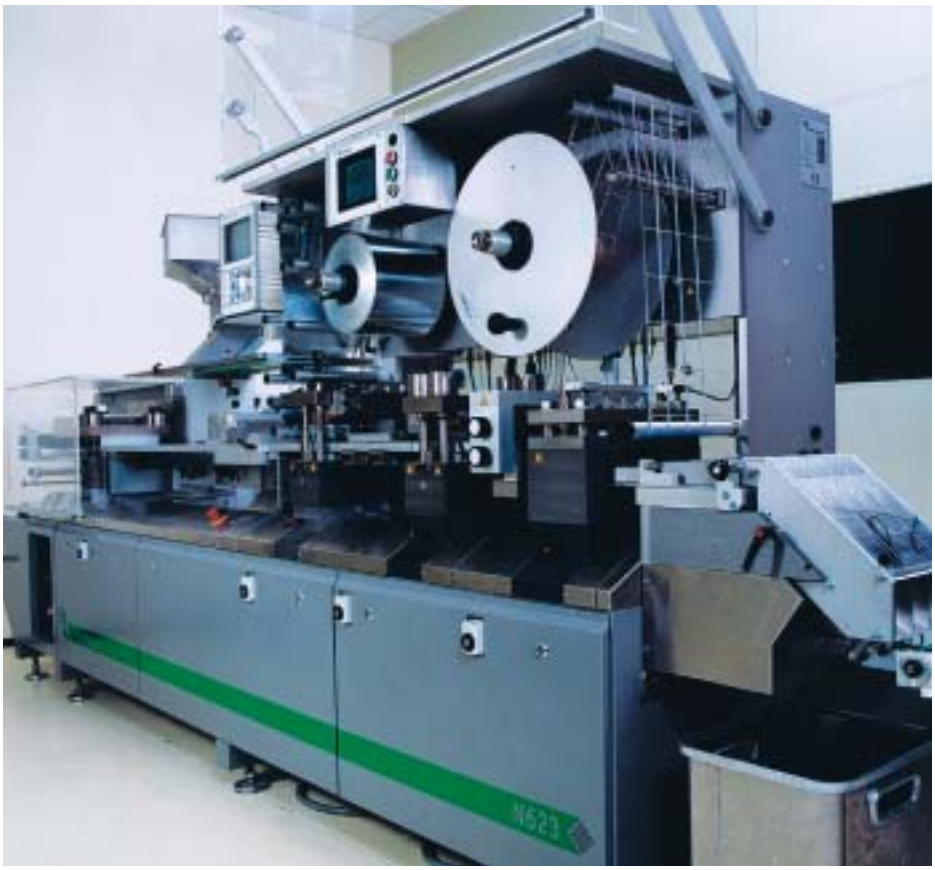
For many years, another general tenet which drove the development of blister lines was speed but, nowadays, most suppliers have high speed machines in their portfolios. Thus, as rapid throughput becomes less of a novelty, the emphasis is moving more to the suitability of the machine for the job, or several jobs, as flexibility becomes the keyword. And this is a trend which has been further strengthened by the move to contract, and to some degree generic, production where the demand is often for short-order solutions.

The capacity to make short runs pay comes down essentially to versatility: the ability to cope with a variety of substrates, rapid changeover, overall reduced downtime and ease of validation. With these attributes, small runs can be offered by contract houses on a truly economically viable basis, as opposed to "filler" contracts just to keep machines turning.

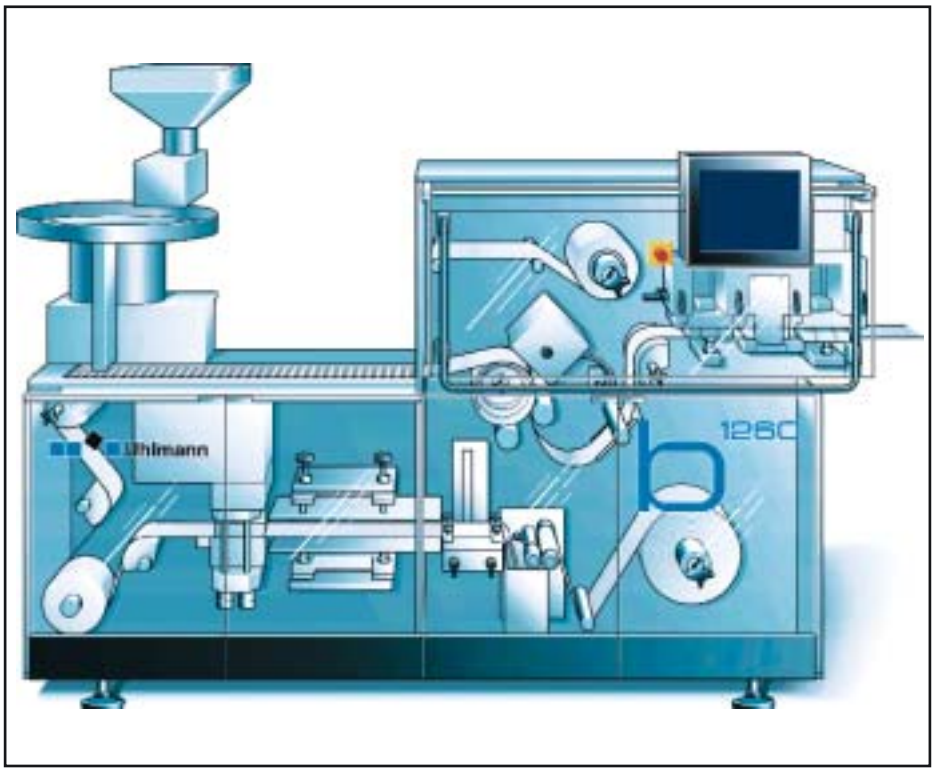
Moreover, with the advent of just-in-time ordering as a means to improve cash flow and reduce stockholding and date-expired product wastage, there is an increased requirement for short-runs to be delivered rapidly.

One way of cutting downtime is to integrate a cartoner with the packer under the control of a single PLC, a solution now offered by a number of suppliers. This ensures compatibility and allows data to be extracted from one source, facilitating record keeping and diagnostics. It also eliminates the requirement for a blister magazine to transfer the blisters to the cartoner, since feeding is continuous.

As the job of manually re-stocking magazines is dispensed with, downtime is further reduced and a potential source of misfeeds is removed.



First of seven in the UK: *Pharmapac installed this Noack 623 machine last year*



Small to medium batches: *New Uhlmann B1260 machine meets accelerating market trend*

The latest integrated line on the market is the MB430 from TMG Marchesini. The machine has been designed to incorporate the advantages of a monobloc set-up, but the use of a pick and place handling system to transport the blisters to the cartoner also allows the line to be configured at a right angle or in a U-shape, should space dictate against a straight run.

The MB430 is operated by servo motors controlled through a single PC which can store a number of product formats. The use of servos has a number of advantages, including fine adjustment to improve operating efficiencies and cleaner and quieter operation.

The all stainless steel, balcony style construction aids GMP compliance while a dedicated, removable product feeder and cabinet facilitates quick changeover.

Compared with previous designs, Marchesini says the number of thermoforming cycles for a variety of substrates, including alu/alu, PVC and polypropylene has been increased, as has the number of cutting cycles. Other features include auto-adjustment of the pitch of the cutting die, individual blister ejection and automatic blister shrinkage compensation.

Maximum batch of 10,000

Uhlmann has focused on the growing demand for compact, efficient and flexible machines with the introduction of the B1260. The company predicts that in the future, 85 per cent of pharmaceutical output will be made up of maximum batch sizes of 10,000 packs.

At this volume, says Uhlmann, large, output-optimised lines become uneconomic because the format changeovers could take up more productive time than the actual production runs and the material consumption for start-ups is likely to be greater than the volume of material needed for the batch.

The B1260 is therefore positioned to exploit the growing market for small and medium batches. It measures 2.6 metres long, produces up to 240 blisters a minute, and features self-regulating web transport before punching, guaranteeing "the high levels of process safety and blister quality you would normally only find on large packaging lines," says Uhlmann. The sealing methodology is continuous motion roller and all functions are controlled via a touch screen which will also display production data.

The machine features the "GMP optimised" cantilevered design of all Uhlmann thermoformers, which eases cleaning, while the user-friendly operational philosophy of the B1260 is said to dispense with the need for specially trained personnel.

A variety of substrates can be handled and large roll diameters up to 600mm for forming film and 240mm for lidding foils enable minimum uninterrupted production runs of 1.5 hours to be achieved. Fully automated production of up to 25,000 blisters allows one operator to handle several machines.

Format changing is based on a centralised tool clamping system which, together with the "substantial" reduction of format parts, is said to yield "enormous levels of flexibility as well as significant cost and time savings". Compact, lightweight tooling sets support effective

handling and optimise tooling costs.

Another supplier which has already moved into the medium-run market is Noack with its 623 blister packer which has been particularly successful in the generic and contract packing sectors.

Supplied by Romaco, the first was installed in the UK a year ago at Pharmapac UK where it has now produced several million packs, operating at efficiencies in excess of 90 per cent, with no technical problems experienced. "Indeed, the only parts we have replaced have been four springs on the stamping out plate , which could well be regarded as consumables," says Pharmapac's operations director Andrew Sampson.

First of seven

Pharmapac's machine was the first of seven 623s now operating in the UK market and Romaco says the key to its success is the simplicity of the machine's design – based on a single shaft drive – which assures ease of maintenance and low manufacturing costs. As a result, the 623 is said to be considerably less expensive than its competitors, yet offers significant outputs of up to 450 blisters a minute.

Wirral-based Pharmapac has three other Noack machines, all of the earlier DPN 760 model, which are suitable for short to medium runs. The 623 was installed to handle a specific contract from a major multinational, where its higher speed was essential to meet the required output.

"The operating efficiencies are extremely high compared with the industry norm of 70 per cent," says Mr Sampson. "We find it easy to operate and extremely reliable, and will be looking to exploit its flexibility by transferring additional products to the machine in the near future."

This flexibility was another key factor in Pharmapac's decision to purchase the 623. It features an extended feeding area which gives the versatility to handle a variety of product formats, while its in-line platen sealing system is suitable for all types of film and foil, including aluminium.

Meanwhile, the specialist pharmaceutical contract packer, Swindon-based TD Packaging, has just taken delivery of a platen sealing Noack DPN 760 blister packer and Promatic Bipak cartoner. Both machines feature extended beds, allowing access for multiple operators during semi-automatic packaging operations.

The new lines represent a significant increase in TDP's blister packing capacity which, prior to these installations, was fulfilled by three existing DPN 760 machines.

On-machine tablet recovery: *IMA C90 at Alpharma empties incomplete blisters for tablets to be re-used*

"Noack's machines have played a key role in the success of TD Packaging," says director and co-founder Martin Tedham. "They are ultimately flexible in terms both of the products being packed and the materials. The combination of this machine, with outputs up to 600 blisters a minute, and the existing and new 760 models allows us to cope with any requirement, from complex hand-filling operations to high-speed, high volume blistering and cartoning."

Tablet recovery system

Another rapidly expanding generic drug manufacturer, Alpharma of Barnstaple, has installed a fifth blister packing line based on an IMA C90 blister packer/cartoner, feeding finished product directly onto a BFB Compact Palletiser. While basically similar to the previous four lines, on this latest C90 the blister packing section has been configured to maximise production and minimise waste.

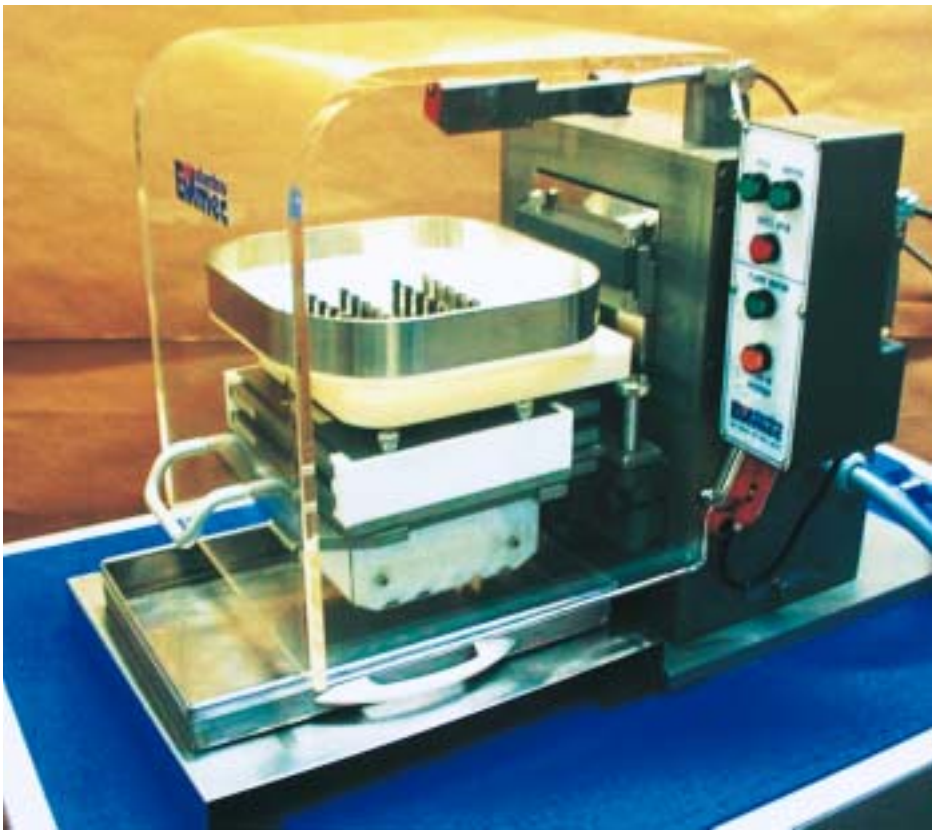
To achieve this, IMA says the C90 is equipped with a special tablet recovery system that not only makes it easier to re-use any tablets removed from incomplete or rejected blisters but also ensures that any waste material is clean and ready for recycling.

Sorting before re-use

Once a blister is formed and tablets fed into the pockets, a colour camera is used to check that every pocket is full. If an empty pocket is detected but all other pockets contain complete tablets, all the good tablets are sucked out of the pockets at the first reject station and fed directly back to the product infeed station to be repacked immediately.

However, if the camera detects any chipped tablets or particles within a pocket, the blister passes on to a second reject station where the contents are recovered for sorting prior to being re-used.

Further along the line, a second, black and white camera is used to check that all blisters being rejected are completely empty before they are fed to the waste collection station, so ensuring that all the material collected is free



Individual dosing tubes: *EMF feeder from Electro-mec (Reading)*

from contamination and ready for recycling.

The C90 is said to be "very flexible" and employs IMA's rotary forming system that allows all types of blister materials to be used, including combinations of aluminium foil and PVC as well as alu/pp and pp/pp and alu/alu.

IMA says it has worked closely with Alpharma on developing special feeding and inspection systems to maximise efficiency in various areas and this latest tablet recovery system provides several advantages.

"It enables the user to track every tablet, making it ideal for use with high value tablets," says IMA. "It also ensures that only good filled product or clean empty blisters are produced, making it easier for users to meet their obligations under the Waste Directive."

Awkward shaped products

Reading-based Electro-mec has tackled the problem of feeding awkwardly shaped or fragile products into a variety of pack formats, a situation which it says is on the increase. The company's answer is a system of individual dosing tubes that place single product into each blister form per cycle so, it says, "ensuring consistency, accuracy and gentle handling".

One company with a requirement for accurate and flexible blister pack filling across a variety of different products and pack formats, Aventis Pharma, has recently installed two Electro-mec EMF3 tablet and capsule blister pack feeders at its Dagenham site.

The first EMF3 has been installed to load capsules into blisters laid out in an existing chevron format. Aventis therefore needed to be able to produce exactly the same pack, although the site's intermittent motion blister machine did not have a feed system for capsules.

The chevron format is difficult to pack effectively because the forms are at an angle. This requires a definite placement of each capsule into a form to ensure accurate filling, as the capsules will not drop naturally, so making traditional methods such as brush box too inconsistent, but the EMF3 is said to have provided the ideal solution.

Aventis has now installed a second EMF3 to be used in conjunction with another blister machine to pack standard tablets. In addition to the two feeders, the company has three interchangeable feed bowls – two for capsules and one for tablets – which offer the flexibility to pack capsules on both machines when required.

Electro-mec has also just introduced the new EMFD range of feeders which include a series of design improvements to give the machines "even greater GMP". In addition, several operator benefits have been devised to make the range more user friendly. Key features are a hinged guard, which gives easier access to the machine, and the re-siting of the control panel to the front of the machine.

Deblistering facilities

The capability for highly accurate feeding is now, therefore, a reality but there remains a possibility of misfills and empty pockets, especially when specialist feeding equipment is not installed. Moreover, product from start-up and test runs still needs to be recycled – especially when high value product is being packed – and so there remains a requirement for deblistering capabilities.

The latest in Sepha Products' line of automatic deblistering machines is claimed to be the world's first "jam-free" model and ideal for peelable and "problem" blisters. The Press-Out Universal deblistering machine can handle blisters of all shapes and designs, including circular, diagonal or irregular layouts and even curled blisters. Fragile tablets with break lines or those which are very small or unusually

Non-destructive test: *Sepha's new BlisterScan replaces the blue dye test*

shaped can also be coped with.

The company says a new design uses minimum pressure to completely invert each pocket, which results in a 100 per cent recovery yield. Capable of operating at speeds up to 50 packs a minute, the Press Out Universal uses dedicated tooling for each design of blister pack, ensuring full GMP compliance. Tool-less changeover takes two to four minutes and the open construction allows complete access for cleaning and changeover.

Leak-testing system

Sepha has also introduced the BlisterScan, which is described as a "new affordable and non-destructive leak tester". Using sensor technology, the tester is being marketed as a clean, dry and non-destructive replacement for the "blue dye" test. With the traditional method, blisters which pass or fail the test cannot be re-used, but with BlisterScan wastage is reduced as passed packs can be reintroduced to the line, while failed packs can be deblistered and repacked.

The test cycle takes 30 seconds and identifies the precise pocket which leaks, facilitating diagnosis and helping to prevent production of a large number of rejects. It detects leaks and weak seals as small as 5 micron across a full cross-section of the blister web.

Finally, Elizabeth Carbide, best known for its tablet press tooling business, has entered the blister packaging tooling arena following the recent purchase of the French manufacturer EPMO.

Carbide, which is represented in the UK and Ireland by Ytron-Quatro, says the company has built a solid reputation in Europe for customised feeding systems, replacement forming, sealing, coding, perforating, cutting and punching tools, as well as quality control parts for blister packaging machinery. ■

FOR FURTHER INFORMATION:

Electro-mec (Reading)	**enter 108**
IMA (UK)	**enter 109**
Romaco UK	**enter 110**
Sepha Products	**enter 111**
TMG Marchesini	**enter 112**
Uhlmann UK	**enter 113**
Ytron-Quadro	**enter 114**

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Display blister packs increase their visibility

It is difficult to imagine a retail environment without display blister packs and it would appear that few weeks pass without another product transferring from boxes or jars to the now ubiquitous plastic bubble. And it is not difficult to see why.

The obvious advantages blisters have over other packaging forms destined for a retail environment are product visibility and a space-efficient, convenient in-store display.

The use of a backing card also provides an ideal opportunity for graphics and "buy me" marketing messages, as well as instructions and more detailed product information. Less obvious are the other inherent attributes of strength – and the resultant high levels of product protection – and tamper evidence.

Display blister packs are also available on a variety of budgetary levels, from basic pre-formed stock blisters and pre-printed cards which merely need a simple machine to seal them together, up to automated custom moulding machines creating and filling packs on-site.

Outsource the operation

Of course, another option is to outsource the operation and Illig says a number of features make its new RD 53 thermoformer ideal for the contract market. It is an automatic low pressure former aimed at small to medium batch sizes and is particularly suited to those jobs which require complex product design and high definition features such as hinges and snap closures. Its simple tooling and rapid changeover times are also among the key attributes demanded by contractors.

Based on newly developed standard components, it has inexpensive forming parts which Illig says makes pressure forming economic, even for small batch sizes. High speeds and increased automation levels of the hole punch, steel rule punch and stacking units, coupled with the rapid changeover, are said to ensure high productivity and reproducibility of all process parameters.

The direct arrangement of vacuum and pressure air valves on the individually servo-driven forming tables also cuts filling and overall cycle times. Up to 500 optimised production parameters can be set and continuous monitoring of process data and error diagnosis leads to rapid remedial action, so minimising downtime.

The company's latest in-line thermoformer and sealer for high volume output of carded blister packs also features quick tool change and easy set-up. The modular designed HSA 50d further develops the flexibility and performance of the 50c model – with which it has common forming and sealing tools – by the extensive use of servo motors and the latest control and regulation technology to ensure precise setting of distances and speed. Up to 40 programs can be stored on the control unit.

Soudal, through its German principal Wenz Blister-Maschinen, can supply a range of machines for producing display blister packs, from conventional heat sealed card back blisters to clamshells.

All the film-based machines use reel fed thermoformable film to produce blister forms either by negative or positive pressure forming, depending on blister profile and size. A small number of lightweight size parts allows easy, quick changeovers which can be further speeded up by the option of fitting menu controlled servo drives.

The WM 120 and WM 220 models are compact, flexible, in-line forming and sealing machines for conventional blisters and feature automatic card feeding via a quick change magazine, product filling from both sides of the machine, tool-less fast format change and a no-waste process. Output is up to 23 blisters a minute on a single lane model and 46 a minute on a two lane.

Multi-lane production

The WM 130 for filmic backed blisters – those sealed with a flexible backing material – allows multi-lane production for high outputs and, in the case of print registered backing material, the draw-off of the blister web is controlled by a photocell. Automatic feeding systems can be easily installed and batch coding in the sealing tools or heat embossed printing is an option.

For captive blisters, where the blister is sandwiched between two cards, there is the WM 300 which is similar in its basic function to the WM

Output doubled: *Rotary blister sealer from Relco at Apex Retail Distribution*

120 and will produce up to 23 blisters a minute.

The WM 400 caters for "blisters" made entirely from board, while the WM 500 is Wenz's clamshell machine. Both have the capability of multi-lane production.

Retail display sector

EDL (Packaging Engineers) Parnavac Division offers a wide range of blister sealing machines aimed specifically at the retail display sector and contract packers.

The range starts with the Model RS1512, a manual two-station machine for slow speed applications, on which the operator manually loads cards, product and blisters into low cost tooling. The table is then manually rotated to move the blister beneath a heated block that seals the blister to the card. Finally, the new complete blister pack is removed and the cycle is repeated up to six times a minute.

For higher throughputs, the Model RS1815 is a semi-automatic four-station machine that incorporates a larger sealing area and automatic table rotation. The RS1815 is optionally available with automatic card feed, automatic product feed and automatic finished pack removal which, together, create a fully automatic blister packing machine with outputs of up to 3600 packs an hour.

EDL Parnavac also builds a range of thermoforming machines that can be used for in-house production of blisters, including the clamshell style which, points out the company, has gained popularity particularly for heavier and more costly items that require optimum package integrity and pilfer proof qualities.

Autoflow Packaging supplies blister machinery on a custom basis, built to customer requirements. Apart from a wide variety of optional features, the machines can be built to whatever width and length is required to fulfil the required production output.

Its main source is TMCI of Italy, and Autoflow says it can cater for a variety of industrial applications from toothbrushes and electrical components to aseptic portion packing for food products.

Relco UK recently supplied a rotary blister pack sealer to Hatfield-based Apex Retail Distribution, whose logistics manager Matt Payne, reports "we have doubled our output using the same workforce". The four station unit has a working area of 700 x 500mm for multiple tooling and maximum output is achieved by use of a variable speed control for the turntable.

Apex's managing director, Mark Barsby, comments that "We are now taking on more business as the output has increased, therefore decreasing our lead time to customers." ■

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EDL (Packaging Engineers)	**enter 116**
Illig UK	**enter 117**
Relco UK	**enter 118**
Soudal	**enter 119**

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