

Shorter production runs put Versatility first

CONTINUED EXPANSION IN THE CONTRACT AND GENERIC DRUG SECTORS HAS INCREASED DEMAND FOR SHORT-RUN, VERSATILE BLISTER PACKAGING MACHINERY.

The quest for higher speed which once drove development of blister packaging machinery has given way it seems largely, but not entirely, to the versatility required to cope with ever decreasing batch sizes.

Moves to a greater proportion of contract, and to some degree generic production, with frequent demand for short-order solutions have fuelled the drive to make short runs pay.

Ultimately this comes down to the ability to cope with a variety of substrates, rapid changeover, reduced downtime and ease of validation, so that short runs to meet just-in-time ordering become viable. At the same time contract packers can then begin to offer short runs on a truly commercial basis, rather than as fill-in contracts to keep machines occupied.

One way of cutting downtime is to integrate a cartoner with the blister machine under a single control system. This ensures compatibility and allows data to be extracted from one source, which makes record keeping and diagnostics that much simpler. It also eliminates the requirement for a blister magazine to transfer the blisters to the cartoner, since feeding is continuous.

Indeed, eliminating the job of manually restocking magazines reduces downtime further and removes a potential source of misfeeds.

However, although this option is offered by a number of suppliers, extremely short runs – from 500 blisters up – also require particularly close control and scheduling of materials and tools.

This is the thinking behind Uhlmann's Blister Express concept of an integrated blister thermoformer, cartoner and stretchbanding machine, aimed at raising efficiencies to as high as 80 per cent for batches of 500-5000 cartons.

"It takes on jobs with operating times lasting minutes – jobs where under normal conditions the initial wastage would be greater than the entire material requirement," says the company.

"It can easily carry out five different production jobs in one shift, none of them bigger than a couple of thousand units, because of mini tools, automatic station setting and a changeover of 15 minutes. Only sufficient materials to complete the run are loaded."

While the machine itself employs a total of 28 synchronised servo drives and lightweight tooling to allow fast changeover, the overall Blister Express concept also relies equally for its efficiency on a separate computer based logistics system. Here, tools and materials for each successive job are stored and managed, for delivery to the machine at the correct time, from Uhlmann's Shuttle vertical storage unit.

Production planning

Called ToolPOP, (Tool and Pack Optimisation Program) this software can also take over production planning for all batches required in a given time and suggest the line, the day, and the time each job should be carried out for maximum efficiency. Deployment of personnel is included also, particularly for multiple installations of the Blister Express, so that machines can be prepared for their next batch as others are running, unattended.

The Blister Express employs an Uhlmann UPS 1010 thermoformer, on which film advance is controlled by laser sensing to correct automatically any deviation as a result of stretch or shrinkage, a C2065 cartoner with motorised size change, and an E3006 banding machine. Output is up to 100 blisters or 100 cartons a minute.

One of the latest integrated lines 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 and a dedicated, removable product feeder and cabinet facilitates quick changeover. Other features include auto-adjustment of the pitch of the cutting die, individual blister ejection and automatic blister shrinkage compensation.

In fact, contract manufacturer Surepharm Services of Bretby, Burton-on-Trent, has recently added 20,000sq ft to its plant and installed an MB430, with the Robocombi pick-and-place transfer unit as well as an MA255 cartoner, helping to expand production to over one billion tablets a year.

"By investing in this latest technology, we aim to expand blister packaging alongside our existing container filling capability, so providing a more comprehensive contract service to our customers," says Surepharm Services managing director Ian Gardner.

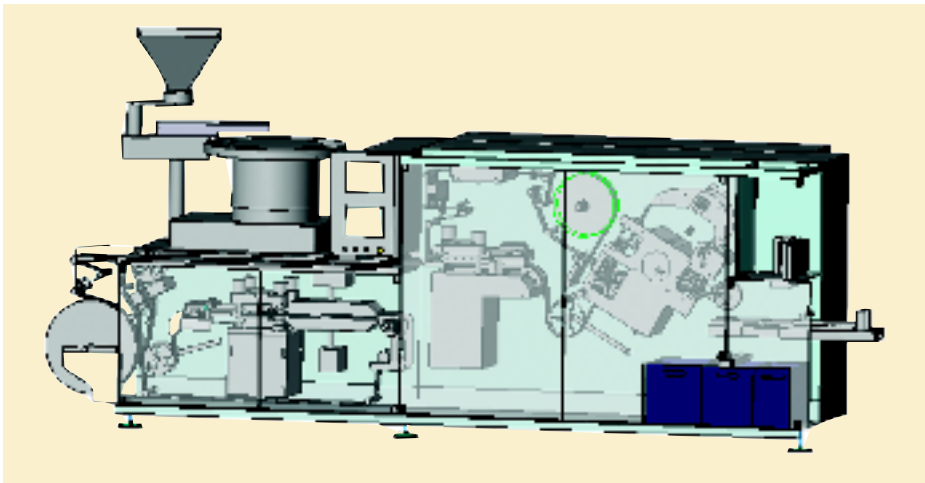
Positive transfer

The MB430 blister packer can run up to a speed of 300 blisters a minute with the Robocombi providing a positive transfer of blisters to the MA255 cartoner, which can reach speeds up to 150 cartons a minute. The cartoner has a new carton erection system consisting of a tilting arm combined with a mechanical pre-breaking feature, which allows the erected cartons to be placed directly into the lugs of the carton transport chain.

Meanwhile, German manufacturer IWKA has announced a new compact blister packing machine, designed to make validation both easier to achieve and maintain by allowing sealing times to be kept constant, irrespective of



Expanding production: Surepharm has installed a Marchesini MB430 blister packing line



Easier validation: IWKA Blisterpac BP10 keeps sealing times constant irrespective of speed

changes in the machine's overall cycle time.

Aimed at small to medium batch runs, the new single lane Blisterpac BP10 runs at a maximum of 300 blisters a minute and incorporates the same intelligent control system used by IWKA in its high speed Blisterpac BP20 machine.

As a result, points out UK supplier IWKA PacSystems, the BP10 requires considerably less time than usual for initial validation and can be run at different production outputs with no need for re-validation. There is also a choice of rotary or platen sealing systems to suit customer preference.

"Users of the machine will no longer need to carry out a series of validation procedures at different speeds to establish the optimum speed for a different product," explains Mike Nicol, sales and marketing director at IWKA PacSystems. "Also, if the feed characteristics of the tablets should change, either during the batch or from

batch to batch, then the output of the blister packer can be raised or lowered without losing validation."

The Blisterpac BP10 employs servo drives for virtually all functions. However, unlike traditional servo control systems, in which there is usually a master servo linked by an electronic reference 'shaft' to the remaining slave servos, the intelligent control of the BP10 is able to adjust speed and dwell relationships between the various drives.

Sealing time is constant

This means that sealing time, as well as temperature and pressure, can therefore be kept constant to give consistent seal reliability.

The BP10 has also been designed for fast changeover and can be set up mechanically for a new product in less than 15 minutes. In addition, points out IWKA PacSystems, the intelligent control system provides rapid ramp up,

bringing the machine to full production speed in a matter of seconds, to give maximum efficiency on short runs.

For optimum GMP the Blisterpac BP10 is built on a balcony basis with all drives mounted behind the machine wall and, wherever possible, all cabling connections between front and back made at the machine wall via plugs and sockets.

"IWKA has aimed at getting as close to total segregation of the product and mechanical areas as possible," says Mike Nicol. "For example, while many blister machines operate the top sealing platen through an open slot, the BP10 employs a lever system through a sealed bearing. Equally, the brush box is powered from an enclosed non-contact drive via magnetic couplings."

Uhlmann has focused on the growing demand for compact, efficient and flexible blister packing 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.

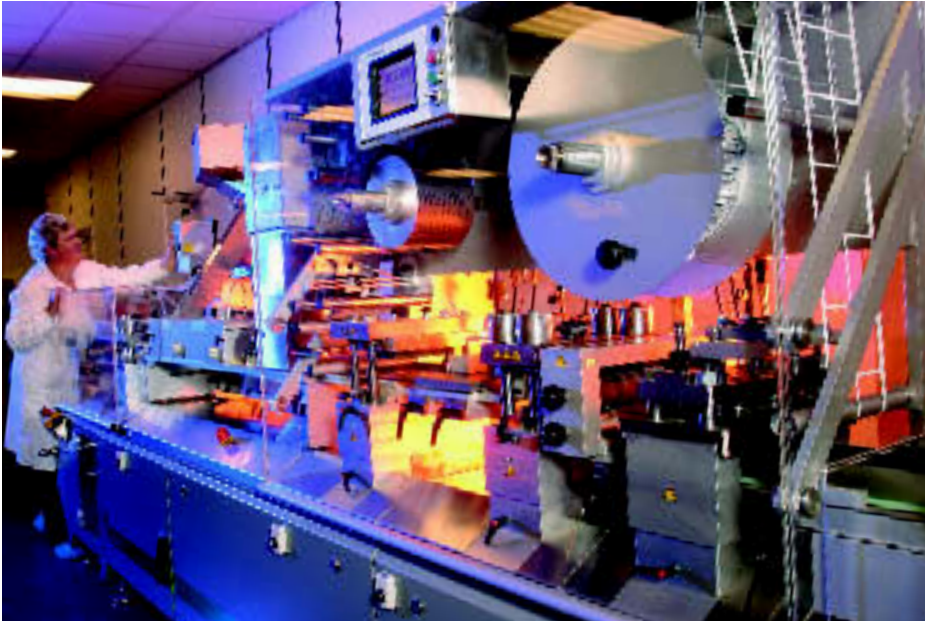
At this volume, says the company,, large out-put optimised lines become uneconomic because the format changeovers could take up more productive time than the actual production runs and the material consumption for start-ups is likely to be greater than the volume of material needed for the batch.

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 method is continuous motion roller while all functions are controlled via a touch screen which also displays 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 enables minimum uninterrupted production runs of 1.5 hours. 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



Medium-run equipment: Adpack has installed a second Noack 623 machine

"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, said to have been particularly successful in the generic and contract packaging sectors.

Indeed, Towcester-based contract packer Adpack Europe has just bought its second Noack 623 machine which joins the existing 623, installed three years ago, and an older Noack 760 model. Both 623 machines are linked to downstream cartoners for fully automatic packaging.

Adpack sales and marketing manager Martyn Clowes says these models, supplied by Romaco UK, are an ideal choice for contract packers.

"All three machines are based on the platen sealing principle, which optimises flexibility where a range of different products needs to be handled and simplifies the requirements for format tooling, while intermittent motion operation allows hand or automatic feeding of product. Additionally we have the capability to produce coldform aluminium blisters, which are the medium of choice for air or moisture-sensitive products."

He continues: "The 623 is easy to clean, has a wide web and large forming area allowing flexibility in blister layout and will operate within a wide cycle range, producing up to 200 blisters a minute."

New from the German manufacturer Wenz

Blister-Maschinen, represented in the UK by Soudal, is a machine aimed specifically at the pharmaceutical industry for low to mid range production volumes of a variety of products such as tablets, dressings, and medical devices.

Built principally in stainless steel, it occupies a floor space of less than 5 sq metres and can handle pvc, pet and ps thermoformable films as well as lidding media including aluminium foil, film laminate, paper and Tyvek.

The first machine has recently been delivered to a Swiss pharmaceutical company for packing medical dressings under cleanroom conditions.

High speed line

However, not all recent developments in blister packing machinery have been in the low to mid-speed range. For example, Uhlmann has launched its UPS 1070 machine available either with intermittent film feed and platen sealing or continuous motion with rotary sealing. In both cases speed is up to 1200 blisters a minute – 1000 on alu-alu – which, says Uhlmann increases output per square metre of floorspace by at least 30 per cent.

The UPS 1070 is a two or three lane machine which employs a new style of punching station to give a choice of three blisters in a row, six staggered blisters or special shapes.

Its high speed, compared with the 400-500 blisters a minute of most thermoformers running alu-alu, is the result of an optimised pocket profile. This, explains Uhlmann, has allowed the diameter of the pockets to be reduced by some 55 per cent without producing over-thin material and risk of pinholing at the corners, so almost

doubling the number of rows possible within a given blister length.

Flexibility does, nevertheless, seem to be the prime requirement for the future and tablet and capsule blister pack feeder manufacturer Electro-mec (Reading) has witnessed a substantial growth in the variety of blister pack layouts. One example is chevron shaped formats that allow more product to be packed in one blister or packs that incorporate two or more different products.

Variety of product shapes

"The number of product shapes has also increased dramatically – from standard round bi-convex tablets to flat or elliptical and multi-faceted shapes, some of which can be brittle or fragile and prone to chipping or breaking if not handled correctly," observes Electro-mec.

As a result, the company finds itself with a marked increase in bespoke project work, based on its EMF feeder concept in which a system of individual dosing tubes place a single product into each blister form per cycle.

At its simplest level this requires the simultaneous feeding of different products into one blister pack. Electro-mec has installed multiple feeders over a single blister forming machine or created split hoppers to allow multi-product feeding from a single EMF feeder unit.

Specially-designed pack layouts have included a 'looped cycle' layout where the first dose has to be isolated. The blister form for this dose is therefore placed on its own at right angles to the other two lines of capsules to highlight the first dose.

Electro-mec has also introduced equipment such as a dust extraction unit, which removes particles given off by tablets during the packing process from the surface of the blister form, and a caplet orientation unit that gently pushes awkwardly shaped products into the correct position in the form. Both ensure that the blister pack can be effectively sealed after filling.

To provide maximum flexibility and enable a variety of different products to be handled on the same feeder with minimum changeover time, Electro-mec has also developed a special EMF feeder with an interchangeable feed system.

This allows the traditional feeder tube layout of the EMF to be removed and a flood box with paddles to be inserted in its place. In this way, easy-to-handle product shapes, which find their own way into blister forms, can be handled with maximum throughput, while individual placement is available for more awkwardly shaped

capsules and tablets.

Custom equipment has also included a system for packing single form blister packs into sachets. The installation includes an Electro-mec designed singles sorter that checks the correct fill of the individual blisters; contra rotating vibratory bowls, which sort and orientate packs into two lanes, single file; and a vertical indexing rotary carousel with vacuum pick-and-place unit to transfer individual units into dedicated infeed chutes above a Volpak sachet machine.

Electro-mec says the system offers increased output and the almost total elimination of reclaim work from mis-fills and double fills, leading to a reduction of manpower on the line as well as less wastage.

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 – specially when high value product is being packed – and so there remains a requirement for deblistering.

Problem blisters

The latest in Sepha's 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 shaped can also be accommodated.

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.

Sepha has also introduced 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 BlisterScan tester can also now be integrated with suitable automatic blister packing lines.

The test cycle takes two minutes and identifies the precise pocket which leaks, facilitating diagnosis and preventing the production of a large number of rejects. It detects leaks and weak seals as small as 5 microns across a full cross-section of the blister web.

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Display blister market attracts more suppliers

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.

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. And new machinery suppliers are entering the market.

Among the latest is flow-wrapping and stretchwrapping specialist Ulma Packaging, which has announced the UK launch of the stainless steel Univers blister machine, aimed at non-food products such as light bulbs, brushes and combs, pencils, toothbrushes, and toys. It inte-

grates all the operations necessary for blister packing into one automatic line and can operate with a variety of forming tools.

"The machine has been specially designed to ensure that customers can achieve high productivity and the minimum of downtime, even when frequent tool changes are necessary," says Ulma Packaging managing director Derek Paterson.

A range of Italian built thermoforming machines is now available in the UK for the first time from WLT, recently appointed distributor for the manufacturer, AL.MA Packing and Packaging Machinery of Como.

Typical medical and personal care applications include items such as disposable syringes, needles, catheters and infusion sets as well as toothbrushes, deodorants and baby products while the range of standard commercial blister packing applications covers the whole spectrum of electrical, DIY, audio and household goods.

Each machine is manufactured to order. "This way they are customised to meet the exact requirements of each customer," says WLT director Mike Essler. "They come in several different sizes and are very competitively priced."

German manufacturer Wenz, represented by Soudal, also builds a range of compact in-line thermoforming machines for producing conventional display blister packs. Starting from reel fed pvc or pet thermoformable film the machines first produce a blister form or forms into which one or more products are fed either manually or automatically.

Subsequently, depending on the type of blister pack required, either a board backing card is sealed onto the blister or alternatively a flexible lidding material taken from the reel is applied. All models feature lightweight size parts which, says Soudal, can be easily and quickly exchanged with no need for tools. ■

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