

Bulmers Ireland installs new line for returnable glass as Cider booms

NEW BOTTLING LINES FOR RETURNABLE GLASS ARE A BIT OF A RARITY IN THE BRITISH ISLES. BUT BULMERS IN IRELAND HAS INSTALLED A NEW STATE-OF-THE-ART LINE THAT SHOWS HOW HIGHER EFFICIENCIES CAN NOW BE ACHIEVED. BY MICHAEL MADDOX.

Cider is the outstanding success story of the drinks market in Ireland over the last decade, more than doubling its market share, largely at the expense of beer. And leading that success story has been Bulmers at Clonmel, Co Tipperary, where earlier this year a new 36,000bph returnable glass bottling line was commissioned by machinery supplier Kronen.

The new line, part of a €16.5 million expansion programme at the site, which also includes a new high bay warehouse, is now handling the 1-pint returnable glass bottles that are playing a pivotal role in the expansion of the Bulmers brand.

"Twelve years ago cider in Ireland was perceived as a low price product, but the Bulmers brand has been repositioned, taking up associations of tradition and heritage to compete effectively in the premium beer market," explains managing director Brendan McGuinness.

"The pint bottle is a traditional size and the pint bottle poured over ice has become a ritual. There is no Bulmers cider in large plastic bottles."

As the name suggests, Bulmers in Ireland shares some common heritage with the English cider-maker HP Bulmer but today, as part of the C&C (Ireland) group, the company is quite separate (see box below).

The story behind the name

The history of the Bulmers and Magners brands date back to 1935 when commercial cider production was started in Clonmel, Co Tipperary, by local resident William Magner. He quickly established a successful business and in 1937 joined forces with English cider-maker HP Bulmer and Co. However, in 1949 HP Bulmer withdrew leaving William Magner to produce cider under the name Bulmers Ltd. In 1964 the company name was changed to Showerings (Ireland) and, soon afterwards, the company moved its main processing operations to the new complex at Annerville, three miles from the centre of Clonmel. However, Showerings last year returned to its Bulmers roots, in recognition of its flagship brand Bulmers Original Vintage Cider.



New line for Bulmers: Pictured are (left to right) engineering manager Frank O'Rourke, production director Peter Chambers, factory manager PJ O'Carroll, and managing director Brendan McGuinness

So successful has the brand repositioning process been that Bulmers now lays claim to 22 per cent of the spend in the Irish drinks market, running neck and neck with Guinness, also last year holding some 22 per cent. Indeed, almost 50 per cent of C&C (Ireland) profits derive from Bulmers.

In the key on-trade market Bulmers Original Vintage Cider now takes some 93 per cent of cider sales, very much a result of the 1-pint returnable bottle for which the new line has been principally built.

However, although the line is something of a rarity, being only one of two installed in the British Isles for returnable glass bottles over the last six years or so, it has been designed by project managers UK Engineering Services to handle non-returnable bottles as well. This would be mostly for exports which currently account for 15 per cent of Bulmers' production.

Here, Bulmers sells under the Magners brand, with packaging and promotional activity based on the same marketing approach that has been so successful for the Bulmers brand in Ireland.

BOTTLING REPORT

There are two Bulmers lines at Clonmel. The first, line 1, handles five different size cider bottles and, although installed during the late 1990s to replace three older lines, very soon ran out of capacity, even on three-shift working, such was the growth in demand enjoyed by Bulmers for its then new 1-pint pack.

In 1997-98 Bulmers sold 1.41 million crates of a dozen 1-pint bottles. By 2001-02 this had soared to 3.3 million crates and is still climbing.

"The Bulmers 1-pint bottle now has the largest sales in Ireland for a single size of drinks pack," explains production director Peter Chambers.

"On the old line we had run out of capacity and could get no further efficiencies. So the decision was taken in March 2001 to install a new line, dedicated to the 1 pint bottle, but with the capacity ultimately to be able to handle 500ml and 330ml non-returnables as well."

The new line had to be capable of 36,000bph but with its older line turning in efficiencies of sometimes below 60 per cent on returnable bottles, Bulmers was particularly keen to see much higher line efficiencies for its new investment.

Reference site in Germany

From a shortlist of three machinery suppliers, Krones was chosen to supply virtually the entire line following a reference visit by Bulmers and UK Engineering Services to a returnable glass bottling plant in Germany, equipped almost entirely by Krones.

"It did not stop from the time we went in to the time we went out," recalls Peter Chambers. "We were particularly impressed by the bottle sortation, the line layout and the conveyor control philosophy."

Bulmers has therefore opted for a high level of automatic crate and bottle inspection equipment at Clonmel, in particular making sure that incoming bottle crates are in a fit state for automatic decrating and that foreign bottles cannot enter the system. In both cases efficiency has been lifted by eliminating potential for jams and consequent downtime.

The line control philosophy, with virtually pressureless single laning and resumption of mass flow, also contributes to efficiency by providing stepless control of throughput.

Bulmers placed the contract in September 2001, calling for the first bottle down the line by mid April and commissioning to be complete by 1 June. Acceptance criteria included a requirement for 83 per cent efficiency over five consecutive shifts.



Eliminating foreign bottles: After decrating the Sekamat sorter (top right) checks bottle profile

"Both of these milestones were passed on time," reports Peter Chambers. "We are highly delighted with the line which was on time and under budget. A significant key to efficiency is that Krones has made individual machines work together, rather than as islands."

During acceptance trials, the line was in fact able to hit 90 per cent efficiency, he adds.

After commissioning, Krones also provided post acceptance support for 12 weeks, with a Krones engineer on site to give extra training and advice, although the main training programme took place in Germany where members of the Bulmers production teams spent a month at the Krones training school. "This was vital," comments Mr Chambers.

Quieter than usual

In the bottling hall itself, originally Bulmers' warehouse, the first impression is of a much quieter operation than usual for a glass line, with quite low noise levels on either side of the filler where mass flow is taken to single lane and then vice versa.

"We are very pleased with the control of the flow of bottles through the combiner to the filler," says Peter Chambers. "Ramp up and down is particularly smooth which means reduced noise and improved efficiencies."

The Krones Glideliner combiner units operate by continuously monitoring the speed of the conveyor and the speed of the bottles, to achieve bottle-to-bottle contact with virtually no pressure, hence the reduced noise. The system also closes smoothly any gaps created by rejects from the empty bottle inspector immediately up line from the rinser-filler.

"We are consistently achieving 75-80 per



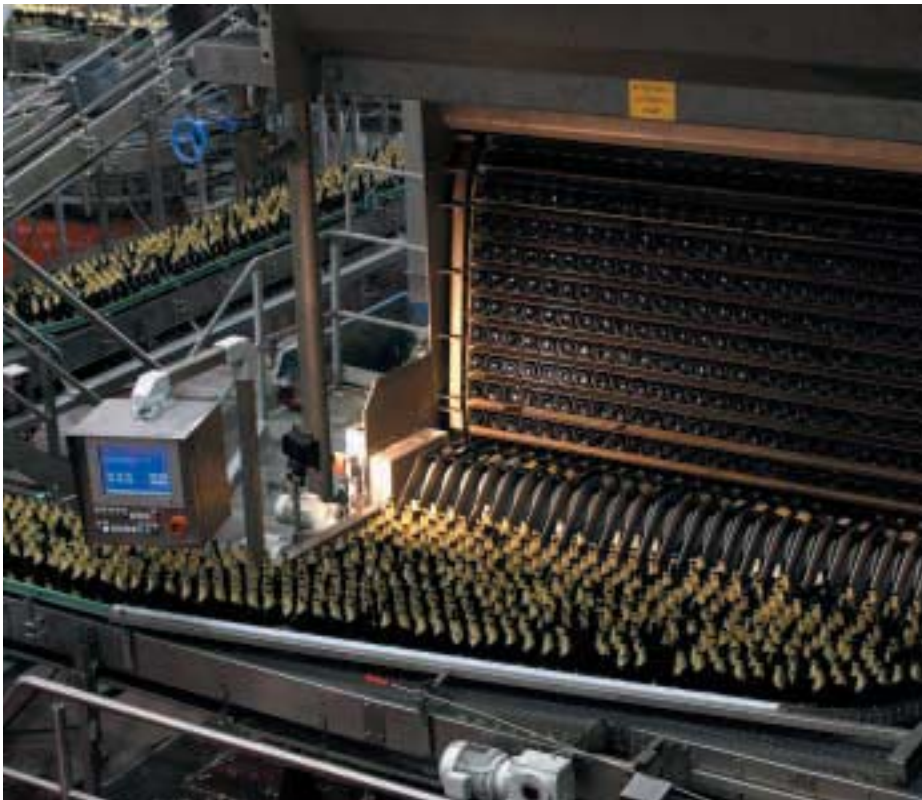
Empty bottle inspection: Linatronic multi-camera vision system checks for chips and other damage

cent efficiency over a full eight hours and can rely on the new line to deliver 17,000 crates a day on a single shift, day in day out," says Mr Chambers.

The line set up

Currently the line is set up exclusively for 1-pint returnable bottles, with pallet and crate handling systems at either end. However, a bulk glass depalletiser is already installed to handle troughs in returned bottle supply and, eventually, shrink-wrapping, case-packing and pallet stretch-wrapping equipment could be installed to handle non-returnable bottles for export.

The layout also allows space for a pasteuriser



Bottle washing: Infeed to the double ended Lavatec machine



Line diagnostics: Terminal at the filler controls gathers data to give speeds, efficiencies and so forth

in the future should the line be called on to handle beer, which is currently part of the contract filling work also carried out on line 1.

Bottles are returned to Bulmers by the on-trade in crates but on a variety of pallet sizes. So after depalletising by a Kettner R50 robot, empty pallets are taken through a Krones pallet inspection system where damaged pallets or those that are not the plant standard of 1120 x 1000mm are separated and removed from the building by conveyor.

Good pallets are stacked and taken to the end-of-line palletiser by fork truck.

Crates are then inspected by a Krones Checkmat LG-UK vision system to ensure that there are no broken or incorrect height bottles, plastic cups or other debris that could inhibit proper operation of the Kettner Blizpack pick-and-place decrating machine.

“You have to remember that these crates have sat in pub yards and could have rubbish on the top and that bottles can be put in upside down or

on their side,” explains PJ O’Carroll, factory manager at Bulmers. “Every time that happened it would stop the decrater.”

So cameras in the Checkmat machine look down on the crate from the top, count the number of bottles and identify any problems that would stop the decrater. Rejected crates are taken off on a spur for attention at an operator position before being returned into the system.

After decrating and accumulation, bottles are single-laned into the Krones Sekamat sorter which identifies foreign bottles by their profile, diverting them to a hopper outside the building.

Impact on efficiency

“Taking foreign bottles out of the line has a significant impact on overall efficiency,” points out Mr O’Carroll. “Wrong size bottles could cause a lot of problems, even jamming a washer pocket, which again means stopping a high speed line.”

In fact, Bulmers has found that some 2 per cent of glass is rejected before it gets to the decrater or washer, underlining the importance to efficiency of the inspection equipment installed on the line. Resetting the decrater after a jam caused by an upside down bottle or plastic cup, for example, could take nearly a minute.

Empty crates are inspected for damage by a further Krones Checkmat, washed in a Krones KGW crate washer and conveyed to the Kettner vertical accumulator, capable of holding 600 empty crates, ready to feed the recrater.

Bottle washing takes place in a Krones Lavatec sized exclusively for the 1 pint container, and double ended to keep clean and dirty glass well separated. Bulmers has also found the Lavatec, which is equipped with settlement tanks to extend the life of the caustic, to be considerably more economic on caustic than the washer employed on line 1, installed just four years ago.

Mass flow conveying from the bottle washer is then taken past the Kettner bulk glass depalletiser, used to introduce new glass in periods when returns fall short and to top up the total population of bottles in circulation. Trippage rate on the Bulmers 1-pint bottle is about 15.

Further inspection of the empty bottles then takes place on the Krones Linatronic, a multi-camera vision system. This checks each container for chips on the neck, damaged sidewalls, scuffing, foreign bodies, liquid carried over from the bottle washer, label fragments and so forth.

Rejected bottles are looped back to an operator position for scrapping or re-introduction to



Recrating: Kettner Blitzpack machines were chosen for both degrading and recrating

the bottle washer infeed. Overall, about 1 per cent of the bottles inspected fail to pass on the first presentation.

The Linatronic is equipped with its own self-checking and diagnostics system, but is also checked physically at pre-set intervals, using bottles with known faults.

The rinser, a Krones Variojet, is monobloc with the Krones Mecafil 110 level filler which operates at speeds up to 36,000bph on the 1-pint bottle but is capable of handling 330ml non-returnable bottles at an enhanced speed of 45,000bph for the future. Fill level is monitored by a Krones Checkmat.

Gold neck foil

Decoration, with front and back body labels and a gold pointed neck foil to underline the premium positioning of the product, takes place on a Krones Topmatic, specified to give 10 per cent greater capacity than the filler/capper, allowing any backlog to be cleared quickly.

Recrating is by a further Kettner Blitzpack and full crates are inspected by yet another Krones Checkmat, which counts the number of bottles, before palletising on a Kettner R50 robotic machine. Pallets are elevated vertically to a high level conveyor for carriage, via a bridge, into the new high bay warehouse.

A further key element in line efficiency, responsible also for the low noise levels, is the Krones conveyor control system which the com-

pany's Glideliner concept of taking bottles from mass flow to single lane has been extended across the complete bottle handling system.

Photocells monitor bottle speed while encoders monitor the conveyor speed itself. This allows the control system to close down any gaps between bottles by increasing conveyor speed, or reduce pressure by slowing conveyor speed should it exceed the speed of the bottles by a pre-set factor. The result is stepless acceleration and deceleration, providing bottle-to-bottle contact with zero pressure, with the benefit also of avoiding risk of damage to premium label dress.

An integral part of the new line at Bulmers is the line diagnostics system supplied by Krones to provide management information within the production office and at the filler controls. Via links to the individual machine PLCs throughout the line, the system is able to gather operational data and present the information as speeds, throughputs, efficiency factors and so forth.

Records can be kept for overall plant management, while access from the shop floor provides line management with immediate information in the event of a fault.

"It's a tough business, doing returnables," comments production director Peter Chambers. "But we have a line that is second to none in Europe. The next step is to get line one up from 50 per cent efficiencies to the high 60s and so we have asked Krones to look at it." ■

More information - enter 175

Focus

CONVEYING

Links that make machines work smoothly together

As factories expand and add new plant, so conveyor manufacturers increasingly get called in to devise bespoke solutions, working alongside manufacturers of filling or packing equipment to make sure the processes work smoothly together.

For example, one flagship contract handled by Derbyshire-based Conveyor Systems (CSL) involved working in tandem with an automatic case packer manufacturer as it installed two units in the bottling and packaging sections of a major distillery.

CSL was asked to design, install and commission a system that linked two existing lines carrying empty cases to the new high-speed packers. Controlled feed and accurate orientation of the empty corrugated cases were two of the prime requirements.

The system design had to be flexible to cater for hand-packing of short production runs and 'specials'. It also had to overcome tight space restraints and – even more of a challenge, according to CSL – accurately turn empty, lightweight cases of various sizes through 90deg, making sure they are correctly oriented before entering the case packers.

"Accurate presentation of cases to the automatic packing/palletising section is a crucial part of the installation," explains CSL director Steve Graham. "It ensures continuity of feed and avoids bottlenecks and downtime."

The automatic case packers were installed to pack bottles from 350ml to 1500ml at speeds up to 35 cases a minute. Tolerances were "minimal" according to Graham, and accurate positioning of materials on the conveyor was critical to success.

Cases turned through 90deg

Various empty six and 12-bottle cases are handled, and the smaller case had to be turned through 90deg to ensure correct orientation for the case packer. This was achieved by integrating twin speed multi-slat band conveyors, giving

on equipment

MICK WHITWORTH REVIEWS
EQUIPMENT FOR BOTTLING

what Graham describes as "a combined braking and slewing action" to turn the empty boxes.

However, the multi-band slat conveyor can be changed when handling 12-bottle cases to feed straight through without turning.

In principle, the turning concept is simple, says Graham. But in practice, the process of balancing slat-band speeds to ensure continuously accurate presentation of various sizes of case, particularly when turning from short to long edge leading, requires some "engineering art" he says.

Side-grip lowerator

Space constraints on the line meant that existing empty case supply conveyors were located at high level in the factory. So CSL elected to replace an elevated belt conveyor with a continuous running, stainless steel side-grip lowerator, which has a small footprint and can be adjusted to suit different case sizes.

The lowerator is designed to provide careful handling of empty case from a powered roller conveyor some 3.4 metres above the floor, feeding down to a roller conveyor at ground level. This unit has the facility to be either driven as part of the automatic case packer feed system, or changed to gravity operation for hand packing – meeting one of the main criteria of the system design.

A two-speed accelerator belt is integrated into the system to ensure correct pitching of the cases, just prior to turning the empty cases smoothly at 35 a minute on the twin-speed multi-band slat conveyor.

Cases leave the automatic packer in slugs of four at a time, and their pitch is then increased on another accelerator belt before they are turned and realigned to short edge leading. The

cases are then ink-jet coded and checkweighed before being carried along a powered roller conveyor to two new case sealers. And from here, finally, they are fed out for palletising.

Meanwhile, Container Systems has undertaken a major upgrade of the three production lines at privately-owned contract packer Online Bottlers.

The Middlesborough based company, which has a large proportion of its production dedicated to Barcardi and other flavoured alcoholic beverages, needed to increase efficiencies and throughput on its main production line. So Container Systems introduced significant in-line accumulation after the filler and installed a zero pressure combiner feeding through to the labelling area.

The line was re-laid to improve accessibility and to maximise the use of space and now runs at speeds up to 400bpm.



Case delivery: Part of the CSL system installed at a major distillery

Line two was completely revamped using existing equipment and extensive refurbishment work was carried out on line three. This included installation of new conveyor systems, a filler/capper/crowner and labeller, and also a refurbished Scharberger semi-automatic depalletiser. ■

For further information:

Container Systems
Conveyor Systems

enter 176
enter 177

CASE STUDY: PONCHE KUBA (BOLS)

Pasteurisation clears a bottle-neck in Curaçau

One advantage enjoyed by bottlers of wines and spirits is of course that alcohol is its own best preservative. So microbiological safety is generally less of a concern compared with risks such as foreign body contamination – for example, broken glass – or post-production product tampering.

But once you start adding more unusual ingredients to the mix – for example, in dairy-based liqueurs – and reducing the proportion of alcohol, rather more care is needed, with products often requiring pasteurisation.

Take the exotically named Ponche Kuba, a brand owned by Bols of the Netherlands but still manufactured on the Caribbean island of Curaçau where it originated.

Ponche Kuba is a creamy delicacy containing eggs, rum and brandy along with other ingredients. "Many inhabitants of Curaçau make it themselves at home, just like we make advocaat," explains Piet van Leijenhorst, head of technological services at Bols in Zoetermeer, Netherlands.

Four years ago, Bols took over the company that first marketed Ponche Kuba commercially and, as van Leijenhorst explains:

"Pasteurisation was done in a way you could term 'craft production'. The closed bottles would go into a water bath and stay there about an hour, of which at least 10 minutes was at 65deg C."

This was considered an acceptable way to avoid microbiological problems with Ponche Kuba, which contains 9 per cent alcohol, and Bols would have continued this way. But the craft process couldn't cope with the volume requirements of a mass-marketed product. Leijenhorst visited the Curaçau plant and found that pasteurisation was the only bottleneck preventing an increase in production. "It was not fast enough," he says.

Bols considered, and quickly discounted, the option of switching production to another country. "We think it's important to maintain the



Faster pasteurisation: NON system supplied to Curaçau for the Ponche Kuba bottles

Caribbean origin of the product," says van Leijenhorst. "It originated there and, as I said, is still a bit of a home-made side-line."

Instead, it went in search of company that could build a pasteurisation system, and hit upon Dutch supplier Noord-Oost Nederland (NON), which was prepared to tailor a system to Bols' precise requirements.

The installation, which is now in full operation, consists of various heat and cooling zones in which bottles, conveyed on a perforated plastic belt, are sprinkled with hot or cold water. Passing through special sprinkling plates, the

water forms a film on the bottles, with each bottle receiving identical treatment in an efficient heat exchange. An energy recuperation system is designed to make the most economic use of energy and water.

"The only remaining snag is the water temperature," says van Leijenhorst. "The water that comes out of the tap in Curaçau is pretty warm. There is scarcely any difference between hot and cold. But that can be solved by further adjustment of the installation."

The Curaçau plant is relatively small, with around 20 employees producing a million bottles of Ponche Kuba, plus some by-products, each year. But the "not inconsiderable" investment in pasteurisation will pay off if the product manages to get a foothold in the North American market.

And according to Chris Holland of Holmach, NON's UK agent, the proliferation of alcopops and dairy-based liqueurs could create more demand for this technology closer to home. "The marketplace has been moving away from pure spirits to products such as Malibu," he says. "Milk and egg based products are beginning to steam ahead." ■

More information - enter 178

UNSCRAMBLING

High speed unscrambler avoids scuffing

High-speed filling of PET bottles begins with high-speed unscrambling, and several features built into the Italian-built Lanfranchi range mean it can lay claim to making one of the fastest plastic container unscramblers on the market. Its largest machine can unscramble and orientate 35,000 1.5 litre bottles an hour.

Lanfranchi's systems are based on a cylindrical drum fed from above. Bottles are carried from the bulk hopper to a conveyor that runs up to the top dead centre of the cylinder.

From there they are dropped into a rotating distribution silo, falling a short distance onto a cushioned distribution cone. This gently moves them towards the company's Lift Master mechanism, which lifts the bottles individually to the orientation bays.

According to Ultrapac, sole agent for Lanfranchi in the UK and Eire: "The Lift Master system is ideal for unstable bottles because all the scuffing and abrasive action is removed."



No scuffing: Lanfranchi plastic bottle unscrambler

The distribution silo is split into three 120deg zones to maximise the performance of the machine and minimise the time any bottle spends in the silo. "Bottles are never in the distribution silo for more than three revolutions," says Ultrapac.

Bottles are released via a mechanism that ensures they drop bottom first between the outside for the machine and its inner skin. Any rejects are removed at this stage.

The base section of the carousel revolves faster than the top to 'scoop' the falling bottles into pockets at the base of the machine. From here, they are removed via a star wheel, correctly orientated. ■

More information - enter 179

FILLING

Ultra-clean systems squeeze out more shelf life

Ultra-violet cap sterilisation, a selection of bottle cleaning systems, full clean-in-place (CIP) and an all-round sterile enclosure – those are the kinds of measures now being taken by bottled water suppliers to ensure the integrity of their filling operations.

In fact, all these features are included in an ultra-clean level filler recently supplied by Filmatic Packaging Systems – represented in Britain by Grunwald UK – to a mineral water company filling bottles up to 1 gallon.

The monobloc machine consists of a 26-head rotary bottle rinser with a 36-head level filler and 10-head capper. It can handle up to 180 of the 1 gallon bottles a minute.

Operation starts with the one or two-stage rinsing of containers, using water, ozone or a chemical agent. Clean bottles are then fed into the 36-head level filling unit, where product is filled to a constant level measured from the top of the bottle. The function of each filling valve is triggered by the presence of a bottle, so if there is no bottle at any station, no water will be released.

After filling, the bottles are automatically capped using a 10-head screw capping unit which similarly includes a 'no bottle, no cap' function. Between the capping and downstream operations, a divert system allows for sampling and cap detection.

Each cap is sterilised using ultra-violet, and the filling system has a full CIP facility using a pre-programmed system that can be tailored to the client's requirements. Finally, the whole machine is enclosed in a sterile air cabin, fitted with condensate and moisture protection.

Ultra-clean packaging environments are seen as a key tool in squeezing more shelf life out of products and thereby giving more flexibility in the supply chain. French manufacturer Erea, represented in the UK by Corporate Packaging, is one supplier that aims to meet this need by designing laminar airflow and overpressure systems which are tailor-made to suit particular filling machines or production areas.

Its Class 100 laminar flow system can be found on many manufacturers' aseptic or ultra-clean machines. It uses a ventilator to pull in air through a system of pre-filters, then blows this



Ultra clean: Filmatic machine of the type supplied in the UK for water bottles up to 1 gallon

air through a number of HEPA (high efficiency particulate absorption) absolute filters, which are positioned above the filling machine.

All Erea units are fitted with airflow regulators that can automatically adjust the speed of ventilators to maintain the correct flow. They can also be fitted with air drying or chilled water coolers to prevent condensation within the controlled area.

Top and side enclosures

Top and side enclosures, coupled with a laminar air filter, are also features of some of the latest filling machines from Italian maker Ocim, now represented in the UK by PLF International.

Ocim makes automatic and semi-automatic rinsing, filling and capping machines giving speeds of 1500 to 40,000bph and, according to PLF, is particularly skilled at one-off, bespoke machinery.

The company's filling technologies include a special version of the vacuum principle, which can be used for filling spirits into glass. Recent installations in the UK, for example, include a 10,000bph filling and capping monobloc machine for miniatures of spirits.

Ocim's pre-fill rinsing/blowing machines and its cappers can each be supplied as part of a monobloc or as single-stand units. The cappers can handle roll-on tamper-proof aluminium caps, plastic press-on caps, plastic pre-threaded and many non-standard caps.

Another recent UK installation – a 24/32/8 tribloc rinsing, filling and capping machine for spirits, running at 10,000bph – included Ocim's self-levelling nozzles. These can automatically adjust filling levels when the bottle size is changed. The vacuum filling system also provides complete emptying and drying of the machine when bottling is completed.

Computerised control of this model provides automatic self-adjustment for different bottle or cap sizes, and it is also possible to control operation of the machine remotely via a modem.

Another name familiar to spirits bottlers world-wide is Dutch manufacturer Stork, which offers a range of free-standing fillers, filler-cappers and rinser-filler-cappers, as well as complete turnkey bottling lines. And its monobloc machines can be electronically or mechanically synchronised with a labeller.

The company claims that 65 per cent of world liqueur volume is filled on Stork equipment, and has supplied the wines and spirits industry with machines to fill bottles from 50ml to 4.5 litres.

Now, after developing weigh filling machines for the dairy and edible oil industry, Stork's designers have come up with a unit for weigh filling spirits into glass or PET. Empty glass bottles vary in weight, which usually makes it essential to use level fillers to ensure a constant level of product in the bottle. But this invariably means overfilling, which means unnecessary cost to the spirits company. So Stork's new Precifill machine aims to guarantee a constant volume of product in the bottle.

One problem with filling by volume is that visual levels can vary, making the consumer suspect that the bottle is underfilled. With the Precifill, says Stork, spirits can be filled into PET, into dark brown glass where the fill level cannot be seen, or into bottles with a wrap-around neck label.

It can fill the correct amount of product into the bottle with the neck label then disguising the variable fill levels. But the bottle will nevertheless conform to the declared volume.

Stork says one such machine, a 32/8 model,

was installed last year at one of Germany's leading liqueur companies and is filling advocaat into 70cl glass at speeds of 12,000bph.

For plastic bottles that need extra leak-proofing and tamper evidence under a screw cap, induction sealing is generally considered a fast and cost-effective method.

The seals are typically in four layers, of which the bottom layer is a polymer compatible with the bottle, and the next layer up is a metal foil.

Caps are supplied to the line with the seals already inside. Once the bottle has been filled and capped it is conveyed under an induction sealing head, which emits an electromagnetic field. This induces an electric current that rapidly heats the sealing foil, melting the polymer and sealing it to the bottle beneath.

Relco UK claims that one of its latest automatic induction sealers, the R2, is among the most advanced models available. Its micro-processor control means it can handle any line speeds, says Relco, and seal closure sizes from 15mm to 110mm diameter with no need for change parts.

In-built self-diagnostic sensors monitor the unit for critical fault conditions and, via a membrane panel, alert the operator and indicate what actions are needed.

Set-up of the unit is completely tool-free, says Relco, and the coil design allows easy alignment to the conveyor and the cap. An IP66-rated version of the machine is available for environments where power-washing is required, and there are 2kW or 3kW options.

Caps for bottled water and insertable pourers for Tetra Pak juice containers are two of the products for which Pneumatic Conveying Systems has designed what it says is an innovative cap handling and conveying system.

The fully automatic system, which can carry caps for up to 60 metres, ensures caps are undamaged by eliminating any moving parts that might come in contact with them.

It offers instant switching between up to four different cap colours, so operators need not empty the previous colour from the storage bin during changeovers. Typical output is some 600 caps a minute. ■

For further information:

Corporate Packaging	enter 180
Grunwald UK	enter 181
PLF International	enter 182
Pneumatic Conveying Systems	enter 183
Relco UK	enter 184
Stork Bottling Systems	enter 185

INSPECTION

Rubber belts put the squeeze on leakers

Fill levels are a critical measure for any bottler. But once filling is complete, how do you tell if a plastic bottle might be leaking before it is case or tray packed along with a dozen or more others?

Heuft, which offers a range of quality control tools for the bottling industry, claims to have come up with a 'radical' new system for on-line leak detection.

Typically installed after the filler/capper, Heuft's 'Squeezer' uses elastomer belts to exert a precise pressure on bottles as they are carried towards the end of the line. The change in fill level is detected by carrying out a comparative measurement of the bottle in unsqueezed and squeezed condition. Any product with a fill level deviating from that of an in-specification standard is rejected mechanically.

The device is said to be suitable for a wide range of soft drinks containers and closures, ranging from simple screw types to complex dispensers.

Data analysed by remote PC

Depending on the line layout, the Squeezer can also be configured to carry out internal pressure inspection, under and over-fill check, closure inspection and filler valve monitoring. All data collated can be analysed either on-line or by a remote PC.

According to Heuft, the system can accommodate rapid product changeovers by using scaled adjustment handles and altering the product program.

Also claimed as 'firsts' in product inspection are two new in-line detection systems from Thermo Electron.

The Alexis Pure Aqua and Pulsar chemical detection systems have been added to a range that already includes metal detectors, checkweighers and X-ray inspection units.

With chilled water becoming more and more popular in Britain's offices and factories, the sector has become a fast-growing arm of the bottling industry. But it brings with it the risk of contamination in cleaning systems and multi-trip bottles returned for refilling. So the Alexis Pure Aqua non-contact sensing system is designed to locate contaminated bottles and is



Checked by a squeeze: Pressure is applied to filled bottles by the new Heuft leak detector



Looking for vent tubes: Metal detector from Fortress operates from the side of a conveyor

claimed to be able to detect foreign compounds at less than one part per million.

It will pick up a wide range of potential contaminants, such as diesel, kerosene, acetone and ethanol, and common household cleaners, as well as more obvious potential beverage contaminants such as flavour agents, beers, wines and spirits.

Detection of nitrogen

An option includes the detection of nitrogen-based compounds, eliminating the risk of bottles being refilled when contaminated by ammonia, cigarette butts or even rodents.

The new Pulsar system is specifically designed to provide on-line CO₂ analysis to test for sulphur contaminants. It provides a continuous

analysis of gaseous or liquid CO₂ streams by the use of pulsed ultra-violet fluorescence (PUVF) technology.

Also available is a range of digital X-ray machines that can confirm the presence and position of fixed or floating widgets in beer bottles or metal cans – the only units of their type, according to Thermo Electron. Detection capabilities of the InScan range include underfill, overfill, net volume calculation, foreign material detection, pressure/no pressure, missing or cocked crown caps and smashed crowns.

According to metal detector specialist Fortress Technology, the wider use of stainless steel conveyors, coupled with the use of metal caps, has made the use of metal detection systems almost impossible.

Avoids cutting the conveyor

Traditionally, it says, the product conveyor would need to be cut and a section of non-metallic belting fitted to allow an aperture-style detector to be fitted. Even then, the detector would still have to be located prior to capping.

But Fortress has developed its own solution to this problem after receiving an approach from a major supplier to the bottling industry. The application, it says, posed "several challenges due to space, cost and timing requirements".

The result – the new Fortress Vent Tube system – is designed for detection of stainless steel filler vent tubing within glass or PET bottles. It can also spot plastic tubes with stainless steel inserts.

Unlike conventional metal detectors, the Fortress system operates from the side of the conveyor and so can be retrofitted with no need to cut the existing conveyor, and used with both plastic and stainless slat conveyors. Importantly, it can also be installed at a point in the line after metal caps have been fitted.

The range of detection ensures the detector – a variant on Fortress's existing Phantom range – can operate across a range of bottles from 33cl glass up to 3 litre PET.

Integral display for line-side performance monitoring is available as an option, and the system is said to offer easy interfacing with existing line controls for either a 'stop on detect' alarm or automatic rejection. ■

For further information:

Fortress Technology
Heuft
Thermo Electron

enter 187
enter 188
enter 189

LABELLING AND CODING

Clear labels give a printed bottle appearance

Juice manufacturer Belvoir Fruit Farms has always traded on its heritage. The company was founded 21 years ago by the brother of the late Duke of Rutland, and its fruit cordials and pressés, in their traditional green bottles, have found markets in Germany, Denmark, Saudi Arabia, Australia and North America as well as the UK.

But the crowded soft drinks sector nowadays calls for a more stand-out packaging format. So, with the launch of a range of new organic sparkling pressé drinks aimed at the mass market, Belvoir took the opportunity to revamp its image completely with new bottles and labels.

It opted for contoured clear glass with clear front and back labels, as well as neck labels, to give the impression of a printed bottle. To achieve this, wet glue labelling has been abandoned in favour of pressure sensitive labels, applied on a slightly angled surface – the challenge being to ensure accurate alignment front and back.

So Belvoir brought in a three station ALS-R series rotary labeller from Advanced Labelling Systems, operating at 60 bottles a minute.

Belvoir sales and marketing director Peverel Manners says the labeller was vital to the company's rebranding project. "The change wasn't just physical. We had to change the way we manufactured our product."

The new vertical paper neck label, displaying the company's crest and folding onto the cap, serves two purposes. It carries an illustration of fruit to show the variety in the bottle and provides secondary tamper evidence. "The cap label is pretty tricky to apply, but was an important element of the overall design," says Mr Manners.

Belvoir's special requirements called for a complex machine applying three separate labels. But, meanwhile, a new labeller from Sessions of York offers speeds of up to 120 a minute by wrapping a single label round three sides of the bottle.

Based on the company's established Sequence Labeller, the compact Trio three-panel applicator is designed to meet the need for extra on-pack information.

Its 'captive label' concept is said to provide



No label look: Belvoir Fruit Farms has installed a three station pressure sensitive labeller from ALS

even application around the sides of the bottle as well as ensuring that the front panel, where the main branding will appear, is also clean and attractive.

Products are controlled prior to labelling by a top-drive conveyor that is synchronised with the main base conveyor. Labels are presented in a fully-dispensed mode to the approaching bottles, which collect them from a vacuum retainer. Side panels are then dressed down as the bottles pass under control through the application station.

Sessions says the Trio three-panel labeller can be quickly and simply adjusted for different pack formats and is "robust, reliable and easy to use".

Codes for traceability

Not all companies want to apply variable data to the label, however. Rockware Glass, which makes green and amber bottles for the drinks industry at its Knottingley, West Yorks, site, has installed 17 Linx 4800 continuous ink jet printers to code bottles for its own traceability purposes.

The 12-character code applied by the printers is a single line of text 2mm high, printed with Linx Clear UV readable 1121 ink, which

has been formulated for security and traceability applications – including coding passports and credit cards as well as drinks bottles.

The ink can barely be seen under normal light but fluoresces purple under UV, making it suitable for discreet coding. Rockware chose it to avoid confusion between the date of bottle manufacture and sell-by dates applied by customers.

One relatively new system from Linx is the Xymark BB2 high-speed label coding system. This, says Linx, "combines the speed and flexibility of programmable dot matrix laser coding with a design that is ideal for integrating into high-speed bottling lines".

The system has already been adopted by a number of global breweries and beverage bottlers. It can code 100,000 labels an hour, which should exceed the requirements of any large-scale bottler.

The Xymark BB2 features a compact laser coding head, and its stainless steel enclosure is rated to IP66. These features mean it can be used in space-restricted and wet environments.

Accurate positioning of the print head on the bottling line is assured using an articulated stainless steel arm. As with all the Xymark laser coders, this features a variable optics

system that is magnetically coupled to sliding rings on the outside of the arm. "The rings allow simple adjustments of print height, dot size and focus without compromising the IP67 rating of the arm," says Linx.

Print-and-apply labeller specialist Logopak claims to have taken ease of programming and labeller maintenance a step further with the development of the Remote Service Module (RSM) for its machines, which are widely used in the brewing industry.

Direct monitoring via ISDN

The RSM is the result of five years' research by the company's German-based electronics team. Initially, it will allow Logopak to provide better customer service by direct monitoring of clients' machines via an ISDN ink.

But it is being seen as the first stage in a process which could result in "total remote connection" of print-and-apply systems for the purposes of database maintenance, label layout resolution and changes, and servicing. "It should eventually also be possible to tackle things like print head maintenance and give closer control of the unit and its operation," says Logopak.

Meanwhile tamper-evident sleeves have provided a double benefit to West Midlands firm Purity Soft Drinks.

According to operations director Stuart Nally, the company installed a Sleeveit system chiefly to allay any customer concerns about product vulnerability but, he adds: "The system has also markedly reduced complaints."

The company, based in Wednesbury, fills carbonated drinks in one litre screw cap returnable glass bottles under its own Masons brand, as well as producing squashes and filling glass bottles under contract to other soft drinks manufacturers.

Transparent tamper evident sleeves with a single red rip-band are applied over the caps and necks of refilled bottles at speeds of over 200 a minute, using a compact Sleeveit SC 250 supplied by Turpins Packaging Systems. The SC 250 stands over the production line, and sleeves are then shrunk by a Shrink-Master 750 recirculating hot air tunnel. ■

For further information:

Advanced Labelling Systems
Linx Printing Technologies
Logopak International
Sessions of York
Turpins Packaging Systems

enter 190
enter 191
enter 192
enter 193
enter 194

AUTOMATION

Intelligent motor control raises spirits at Allied

Teachers whisky producer Allied Distillers has invested over £15 million in new technology at its Dumbarton site – said to be the first fully integrated bottling and manufacturing facility in the Scotch whisky sector.

The development includes a fully networked system for controlling key machinery, monitoring its performance and diagnosing faults as they occur, which has already resulted in valuable reductions in downtime.

The extension to the Dumbarton plant, built to replace an older facility in the town, packs over 10 million cases of Scotch, gin, vodka, liqueurs and other specialist products each year. Tankers deliver spirits in bulk to the site, where they are blended and filtered before being transferred to the bottling area. After filling, labelling and packaging, products are ready for warehousing and despatch.

As part of the development project, Allied has set up a plant-wide intelligent control system to provide the management team with the maximum information and control.

The factory now makes widespread use of intelligent plant devices – including Allen-Bradley drives, PanelView HMIs (human-machine interfaces) and new Allen-Bradley 193-E3 electronic motor protection relays – networked together using Rockwell's DeviceNet system. Together, they are making the work of engineers simpler and reducing downtime by pinpointing the source of problems as they arise and helping spot areas for preventive maintenance.

Major upgrade of the control system

The use of the 193-E3 motor overload relays was part of a major upgrade and expansion of the control system, which also included replacing existing Allen-Bradley PLC-3 and PLC-5 controllers with the up-to-date ControlLogix system.

The new relays are used on the vatting and tanker stations, and over 30 starters from the Allen-Bradley MCS (modular control system) range have been installed in two 'intelligent motor control centres' used to control the plant.

Allied electrical engineer Stephen Trainor says the company is one of the first in the UK to



Intelligent control system: Machine performance data is available immediately to the operator

use the 193-E3s, and says it has "successfully integrated them in our overall plan to build distributed intelligence into our plant".

Intelligent overload relay

The 193-E3 Plus is described by Rockwell as 'an intelligent overload relay equipped with a range of sophisticated features that extend beyond enhanced motor protection'. These include overfill protection and the scope to operate in 'failure prevention mode'. This enables a 'holding' condition to be maintained in the event of failure in the network and can be used, for example, to maintain levels in storage tanks in a continuous process.

Traditional overload relays are reactive: a fault will trip the relay and stop production. But the E3 Plus incorporates advanced warning functions that include the ability to set up alarms for fault conditions caused by, for example, high motor temperature. It is also said to provide an accurate indication of a pump running dry.

Warning signals allow operators to investigate the cause of a problem before the motor trips – and allows engineers to intervene before production is disrupted. The E3 also provides current monitoring over the network, which can be data-logged around the clock.

The E3 motor protection relays, PanelView HMIs and the Allen-Bradley 1305 and 1336 variable speed drives are all connected using

BOTTLING REVIEW

DeviceNet. A card in the ControlLogix system makes the interface between DeviceNet and the PLC, with an Ethernet link being used to connect to the PCs in the control room.

There are several DeviceNet networks, each used to bring together the control devices in a particular area as a daisy chain. Each segment is terminated in the ControlLogix system.

In the control room, PCs run Rockwell Software's RSView32 plant monitoring package to visualise the complete system. As well as being able to control and configure individual devices using the PC, the operator can interrogate each device and display parameters such as status, motor current and, via thermistors, monitor the motor winding temperature. Diagnostic information includes device, trip and warning status and a history of the previous five trips.

DeviceNet is used for local communications, but ControlNet is used as the main plant network, providing a 'backbone' for communications between the ControlLogix systems and collecting information from all areas for the supervisory system.

Troubleshooting and diagnostics

According to Rockwell, the advantages of using 193-E3s in conjunction with DeviceNet became apparent to Allied even during the commissioning stage. The system's troubleshooting and diagnostics facilities quickly found any problems with configuration. Now the system is live, the company uses the same features to trace and correct problems before it has to interrupt production.

"Before we upgraded to intelligent motor protection and DeviceNet, when an alarm light was displayed on the production line it was a case of finding the right drawing to identify the nature of the problem and then going to fix it," explains Allied's Stephen Trainor. "This could take some time, and at busy times of year – for example, just before Christmas – any interruptions can quickly affect production."

Now, he says, engineers know immediately the nature of the problem and where it is located. "As well as reducing downtime at the plant, we now have the benefits of centralised control and access to detailed status and history information for individual devices.

"We're starting to use remote messaging to direct our engineers to a fault from wherever they are on our site, and our long term plan is to extend intelligent motor protection to the entire plant." ■

More information - enter 195

SHRINK-WRAPPING

Single reel units prove economic at lower speed

A firm trend in recent years has been the increased use of single reel sleeve wrapping machines. These were developed initially for high speed operations up to 100 packs a minute, which is achieved by eliminating the horizontal sealing bar used in the two reel sleeve wrapper.

On these machines, film is drawn from a single reel mounted below the product conveying level. This film is cut to length and then wrapped around the pack with the ends simply overlapped underneath the pack as it moves to the shrink tunnel. Here the overlap of film fuses to form a seal while the loose film either side of the pack shrinks to create the classic bulls-eyes or bullet holes.

In recent years, the price of single reel sleeve wrappers has come down, allowing them to be used for applications at, say, 30 packs a minute, which in the past would have been achieved by a two reel sleeve wrapper working at the top of its speed capability.

However, price was not the only limit on the application of single reel sleeve wrapping machines in the past. On most machines of this type the mechanism that takes the cut film and wraps it over the moving pack, is specific for a particular pack. A higher or longer pack requires a longer length of film and this in turn requires a different arc of movement from the film wrapping mechanism.

On most single reel sleeve wrapping machines therefore, a change in pack meant an exchange of size parts, making pack size changes relatively lengthy tasks. However, Italian manufacturer Dimac, part of the Aetna Group, has developed an answer for its new Star series, launched in the UK at the PPMA Show 2001. Ten lines have since been installed in the UK.

Indeed, the Star single reel shrinkwrappers are built to a modular design that allows the machines to be upgraded in the field to meet increased demand or changes in pack specification. Wrappers supplied initially for 20 collations a minute can be modified to run at 30 or 45 collations a minute and a wraparound tray or base-board insertion station added.

"This gives lower volume users in particular the advantages of a single reel machine from the outset, without the commercial risk of installing equipment that may eventually be unable to keep pace with demand," points out Aetna UK managing director Mark Tucker.

All modules are built in separate frames that bolt together and have their own individual servo motor drives. This means, for example, that a tray or base-board feed module can be readily added within the base of the collation module, delivering up through a modified dead-plate. Shrink tunnels, too, are built to accept extra heating modules to cope with higher speeds.

Instead of the conventional vacuum belt film feed system, the new Star series employs a rotary cutting knife and servo controlled drive



Film drive: Dimac's new system, shown open

rollers set immediately beneath the transport level. This means that the cut sheet of film is driven positively onto the product conveyor and accelerated to the speed of the flight bar, providing optimum print register accuracy. In addition, the mechanism is simpler than vacuum belts, and can simply be slid out from the machine for maintenance.

Single wrapping bar

Dimac is also using a new single wrapping bar arrangement in place of the more usual multiple bars, carried on a chain, so providing quick single point adjustment by handwheel for different product heights. A simple slide and variable length lever arrangement for the drive allows the bar to describe a fixed length ellipse, so maintaining pitch, but at whatever height is required to lay the film securely onto the collation concerned.

The collation system for the 20 and 30 a minute machines relies on mechanical gating and handwheel adjusted lane guides. For speeds of 45 a minute, the mechanical gating is

replaced by Dimac's twin conveyor system, which uses acceleration of the second conveyor relative to the first to provide the space between collations. Dimac also builds machines capable of handling up to 70 packs a minute.

Installations in the UK now include a Star FX30 system specified by Kensal for the Belhaven Brewery. This model is designed to handle a variety of sizes of glass bottles in trays, at up to 35 packs a minute. It can also take a range of smaller multipacks for collation into single shipping units.

In addition, Dairy Crest Kidlington has installed the Star system to multipack 200ml plastic bottles of children's drinks while, outside the UK, Central Bottling has ordered two Star 30s and one Starfilm RS, with speeds up to 50 a minute, to pack beer in breweries across the Ukraine.

For those bottlers choosing to shrink-wrap part or all of their output, the choice of machines continues to grow. For example, Yorkshire Packaging Systems (YPS), sole UK distributor for Rochman machines, has recently released a new range of high-speed trayless shrinkwrappers designed specifically for the needs of the bottling industry.

"Due to cost, most bottlers want, and often need, to wrap their collations of bottles without a tray," says YPS sales director Glyn Johnson. "With milk, most containers are square, making handling much easier compared with round bottles where more care is needed to keep the collation together, especially at high speeds."

Among other companies offering shrinkwrappers for supported or unsupported collations is Adpak Machinery Systems. On its fully automatic machines, changes to pack formation or size can be made within minutes, it says.

Adpak's Model A700SEL semi-automatic sleeve wrapping system allows the product to be wrapped without trays. Instead, the operator places the bottles into an adjustable product pusher unit which supports the collation as it moves into the film web.

The A700SEL can handle bottles from 250ml to 3 litre with "minimum adjustment", and is said to be suited to packers requiring a compact, flexible, cost-effective unit. Adpak says a large number have been sold into the mineral water industry. ■

For further information:

Adpak Machinery Systems
Aetna UK
Yorkshire Packaging Systems

enter 196
enter 197
enter 198

CASE STUDY:DIAGEO

Case and tray packing puts focus on extra productivity

Thriving export markets are keeping Scotch whisky producers busy. Last year saw overseas sales of Scotch top one billion bottles for the first time, with value up 6.4 per cent to £2.3bn.

Diageo has taken a leading role in cutting costs and raising productivity in the industry, by mixing steady investment in new equipment and radically improved systems and working practices, with a focus on core, global brands at Shieldhall, Kilmarnock and Leven.

In all these plants the focus on better efficiency is evident from bottling right through to end-of-line. The emphasis is on "fewer lines, running faster and for longer," points out Dick South, managing director of Cermex UK, whose French-built case-erectors, case-packers and shrink-wrappers are widely used by Scottish spirits bottlers, including Diageo. "In case erecting and packaging we're probably number one in Scotland," says South.

Diageo's plant at Leven has 17 bottling lines in its spirits section, with a mixture of near-continuous operations – for example, bottling Smirnoff, the world's biggest selling vodka – and shorter-run products such as the six-strong Classic Malts range.

The latter, which sell at over £30 a bottle, are mostly packed by hand to ensure there is no risk of labels being damaged, and here Diageo only looks to achieve 15-20 12-bottle cases a minute. On the high-volume Smirnoff and Gordon's lines, by contrast, line speeds will be closer to 400 bottles a minute.

Across the plant, bottles range from conventional 70cl and 75cl to flask-shaped half-bottles and miniatures, and are nearly all glass. These are depalletised in a separate hall, then conveyed through a 'hole in the wall' into the main filling and packing hall, where much of the filling, capping and labelling is carried out. Many will also be individually cartoned before case-packing.

Two new Cermex lines

Cermex equipment at Leven includes two fairly new lines for tray-packing, shrink-wrapping and wrap-around casing of flask bottles, and a new miniatures line for tray-packing and shrink-wrapping plastic bottles of spirits for inflight service by airlines.

The latter is a continuous-motion single reel machine packing 300 bottles a minute, using printed film that is registered via photocell to the pack. Bottles are fed by the Leven plant's first air conveyor.

Sam Johnstone, a packaging project engineer at the Leven plant explains the machine can be adjusted for different bottle shapes within minutes. "Even though the bottles are very light, the machine compacts them very nicely," he says.



Continuous motion: Scroll infeed to Cermex TS tray packer and shrinkwrapping machine

BOTTLING REVIEW

A priority for volume producers is to avoid stopping and restarting bottling and labelling machines unnecessarily because of problems further down the line. Halting labellers mid-run can lead to problems with label application, and bottles that are inside the machine when the red button is pushed may have to be removed for reworking. So it is critical to build in a sufficient buffer between labelling and end of line, and high-speed plants such as Leven and Shieldhall typically include lengthy accumulation conveyors running in 'S' bends behind the case-packers.

Fed with steady pressure

This not only avoids product backing up to the labellers, but ensures product is always available to the case-packers which can then be fed with steady pressure.

Diageo's end-of-line operations employ a mix of top-load pick-and-place and wraparound case-packing systems which, observes Dick South at Cermex, reflects the challenge faced throughout the spirits industry in balancing speed, cost, ease of changeover and machine footprint alongside the packaging requirements of different markets. Each system has its pros and cons.

Wraparound machines are fast, offering speeds in excess of 500 bottles a minute. By wrapping the case tightly around the bottles they avoid the need, and therefore the cost, of cardboard dividers – in theory at least. Glass-to-glass is certainly fine while the cases remain palletised, but some export markets, notably the US, have experienced breakages as a result of rough handling once individual cases are taken off the pallets.

So the US is now asking for dividers to be included in over-wrapped cases too, creating new complications for machinery designers and requiring machines that take up more floor-space. This can be quite an issue, since the wraparound machines are already large, with every part of the continuous-motion process happening in line.

There is also the issue of flexibility. High-speed wraparound is probably not suitable where relatively short runs and frequent size changes are the order of the day.

Pick-and-place units are smaller and cheaper, offer simpler changeovers, and are easier to accommodate where space is at a premium. But cases still have to be erected somewhere and conveyed to the line. And whereas wraparound machines ensure a tight fit, pre-

erected cases are always slightly over-sized to ensure that the bottles can be easily placed inside by machine. Which is why they need dividers – to stop the bottles rattling around.

"It's a juggling act," says Dick South. "Case erectors, spacers and conveyors take up space elsewhere, but wraparound machines mean taking cardboard blanks into the production hall itself, which no-one really likes to do these days.

"We make wraparound machines as well. They can do the speed, and they give you glass-to-glass packing with no dividers. But if you are looking for flexibility they are not necessarily the best way forward."

At Diageo's Shieldhall plant near Glasgow airport, a number of Cermex case erectors are in operation in a separate hall. Once the cartons are made, dividers are inserted by machine, then the whole assembly is sent to the packing lines via a system of overhead conveyors.

Dick South says the case erectors are deceptively simple, but getting the right case shape is essential if dividers are going to be added by machine. The Cermex system half-makes the case and prepares the flaps with hot-melt glue, then squares it up mechanically before making the final join with a compression ram.

Like Cermex's case packers, its case erectors have been designed with speed and ease of changeover in mind. All change-parts are clearly labelled with a code number that corresponds with the appropriate part on the machine. A simple chart provided with each machine reminds operators what changes are needed for each new case or product size.

Size change in 5-6 minutes

The F37 case erectors used at Diageo run at 30-32 cases a minute. Achieving significantly higher speeds would require a totally different mechanism that would slow down changeovers. "You can do a size change on this in five or six minutes," explains Dick South. "If you go to a multihead machine it's a different matter

"Buying a case erector is a bit like buying a car. There are loads around that will do up to 20 cases a minute. If you're looking for 30-plus, there are only a few suppliers that can do it."

He continues: "Higher speed is definitely the way forward, but so is flexibility. The kinds of contracts we are signing now are also looking for very high levels of efficiency on machines that will run 24:7, and speed, flexibility and reliability don't always go together."

More information - enter 199

PALLETISING

Robotic systems demonstrate their flexibility

Robotic palletisers come into their own when flexibility is required, such as loading display pallets in a recent bottling industry installation by the French manufacturer Newtec Palettisation, represented in the UK by Adpal.

Delifruits, one of the major players in the production of fruit based drinks in France needed a system with the flexibility to palletise collated shrink-wrapped packs of PET bottles as well as display palletising of individual bottles in jumbo trays for end-of-aisle display in supermarkets.

Speed required was 12,000 to 20,000 bottles an hour and the system had to be capable of palletising onto Euro or half pallets, accurately and while making optimum use of factory space.

Three four-axis robots

Newtec's solution involved two four-axis Pal-Vite 410 robots, each of which can handle the collation packs or full layers of bottles in bulk, with automatic change of gripper.

A third Pal-Vite automatically places inter-layer sheets or jumbo trays, as required. Line infeed is achieved by two conveyors for the collated packs or from a layer preparation table for the display palletising. Putting the infeed systems on two levels made best use of space.

Meanwhile, the start of 2002 saw cider maker HP Bulmer take delivery of a low level pack palletiser from ACMI UK. The installation, managed by Elson Projects, was part of a new one-way glass installation at Bulmer's Hereford bottling plant, for which ACMI, based in Italy, also supplied the pack conveying system.

The palletiser is a P130 2I model – a twin-lane infeed, low level, fully automatic machine. Pallets are held at one level while complete layers of bottle packs are transferred, one at a time, horizontally and vertically until the pallet is fully loaded.

ACMI points out that its palletisers can now be supplied complete with stretchwrappers – either of the rotating arm type or with a rotating pallet – to provide a "functional and high specification end of line system".

Internationally, ACMI's clients include



PET bottle handling in France: Robot palletisers installed by Newtec for Delifruits

Perrier, Groupe Danone, San Benedetto and Martini Rossi as well as HP Bulmer. Its end-of-line equipment includes palletisers and depalletisers, multifunctional robots, case formers, pallet stretch wrappers and pallet strapping machines, crating and decrating machines and conveyors, as well as automation, distribution

and control systems. It regularly handles complete turnkey projects.

The company's current range "easily covers the full spectrum of medium to high speed palletising requirements," according to UK sales director Rick Gerrard. "Our low level infeed machines can handle 120 to 360 layers an hour,

and our high level systems can easily reach speeds of 500 an hour," he explains.

Planet Flowline has recently completed the installation of two more high speed PET bottle conveying and palletising lines at Schmalbach Lubeca's factory near Wrexham.

Receiving bottles from the blow-moulders, the Zecchetti air conveyors carry the bottles at speeds up to 30,000 an hour to the high speed Zecchetti palletisers, which deliver to automatic strappers and then on to a shuttle car that carries the pallets to the central stretch-wrapping system.

Planet Flowline says the conveyors are able to handle a wide range of containers gently, without risk of scratching or other damage, as a result of the variable flow air fan system.

The central control system matches line requirements to bottle type automatically and, on this particular installation, all air conveyors are suspended from above, leaving an open area below for ease of access and hygiene. ■

For further information:

ACMI	enter 200
Adpal	enter 201
Planet Flowline	enter 202