

Niche products cast new light on Aseptic potential

NICHE PRODUCTS SUCH AS YOGHURT AND SOME 'HEALTHY' DRINKS ARE BEGINNING TO CUT THROUGH WHAT HAS, UP TO NOW IN THE UK, GENERALLY BEEN A WALL OF RESISTANCE TO ASEPTIC FILLING. AT THE SAME TIME INSTALLATION COSTS ARE STARTING TO FALL.

The UK has become almost as famous for its resistance to aseptic filling as it is for its resistance to the Euro, cold beer and foreign languages. As one sales director, puts it: "We find it easier to sell our aseptic technology in Bosnia and other parts of the former Yugoslavia than we do in the UK."

But the tide may be turning. Part of the explanation for resistance to aseptic has always been the particular range of products supplied by UK retailers, and consumer preference for 'fresh' as opposed to longer shelf-life items. Alternatively, long life products have been packed in aseptic cartons.

But in many cases, the main customer consideration has been cost. Over recent years, the step up from ultra-clean to fully aseptic filling has meant at least a doubling of the installation cost. Running costs and consumables have tipped the balance still further in the direction of alternative technologies.

That imbalance may have already begun to change, though, with signs that at least one equipment supplier is reducing this price differential between ultra-clean and aseptic – and potentially causing competitors to reconsider their own pricing levels in the process.

At the same time, suppliers point out that the shift towards drinks with healthier images is favouring just those types of still beverage – many using subtler flavours and sensitive ingredients or else avoiding preservatives – suited to the cold aseptic process.

Foreshadowing this shift in thinking about aseptic filling has been the rise of ultra-clean

and extended shelf-life (ESL) alternatives. In fact, the availability of systems which can extend shelf-life on dairy products to 30 or even 45 days has, it can be argued, undercut the need for more expensive and complex aseptic lines offering at least double this shelf-life.

In the longer term, though, these options may be seen as having paved the way for greater acceptance of aseptic filling by demonstrating the supply chain benefits of longer shelf-life.

Aseptic filling for bottles

Some three years ago, Serac arguably drove the first wedge into the unyielding UK market with the installation of two aseptic lines at Glaxo

"You could argue that you don't need that degree of sterility for fruit juices, but the customer wanted the very best product safety it could get."

Since then, at least one additional aseptic line has been installed by GSK for other products, though this is understood to have been supplied by Krones rather than Serac.

Meanwhile, Serac says its technology is also responsible for some aseptically-filled products which are found on UK retailers' shelves but which are filled overseas. For example, the company has installed several aseptic fillers in France and the Far East, which are filling Lip-ton Ice Tea into 1.5 and 2 litre PET bottles.



Serac aseptic filler: Much R&D effort has gone into handling sports cap sterilisation

The fashionable sports cap has posed a particular challenge at the pre-fill sterilising stage, explains Michel Titera. The complex geometry of these caps meant that no dependable on-line sterilising process could be found, so fillers had to rely on a costly pre-irradiation treatment. Now, after much R&D effort, Serac says that collaboration between itself and a cap manufacturer has resulted in a reliable on-line system.

Krones has also had to address the question of sports caps. "Currently existing

designs need to be pre-irradiated," says Krones UK technical manager Andrew Wilson. There is a great deal of work underway to allow this closure type to be handled in a similar way to conventional caps, he adds.

Krones reports that the market for soft drinks in the UK is showing distinct signs of moving in the direction of aseptic filling. The

Smithkline's nutritional division. The first of these lines fills 500ml bottles of Ribena and Lucozade at speeds of 300 bottles a minute. The second line doubled this filling rate.

"The reason why GSK went with Serac is that it is a pharmaceutical company, and it wanted the highest possible hygiene standards," says Michel Titera, sales director at Serac UK.

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shift has come in the last 12 months, says Mr Wilson, with the first of three lines sold to date being installed only at the end of last year. Two of the three lines are filling isotonic-type products, he explains, although the details of each installation are still subject to confidentiality agreements.

"We are seeing a massive trend in the UK towards non-carbonated soft drinks with a healthy image," he says. Because many of these include sensitive ingredients, cold aseptic filling is often the only possible route, and avoids the need for preservatives.

Cutting capital costs

Krones UK attributes at least some of its recent success in aseptic applications to its ability to cut capital costs through the use of its latest isolator technology. Ever since the food sector first imitated the pharmaceutical industry's clean-rooms, equipment suppliers have been focused on reducing the size, and therefore the cost, of the sterile environment.

"The initially slow reaction in the UK to cold aseptic filling was largely because of the high capital cost, not only for the filler itself, but for all the auxiliary equipment to go with it," explains Andrew Wilson.

In the aseptic system used by Krones, bottles are sterilised with peracetic acid (PAA), using steam as a carrier. There is a holding time before a second PAA wash, then a second holding time before the packs are rinsed in sterile water. Only then can the UHT-treated product be filled.

Mr Wilson admits that the alternative hydrogen peroxide systems do have certain advantages but, equally, points out the potential drawbacks.

He says: "One disadvantage is that for lightweight bottles there is a risk of container deformation due to the higher temperatures used for H₂O₂. Container sterilisation has been an ongoing area of development for Krones, specifically in relation to the reduction of running costs, and the results of these developments will be showcased at Drinktec Interbrau in September."

Like Krones, Serac uses a 'wet' or waterborne sterilising system. Unlike many suppliers, the company's current view is that full aseptic standards can only be achieved using a full bath for containers and closures in the sterilising agent – in Serac's case both H₂O₂ and PAA. Michel Titera explains: "The process uses more consumables, but it means you have a fully

aseptic cap and bottle." At the same time, like its competitors, Serac is always looking at ways of reducing costs, he says.

Other suppliers such as KHS are understood to have developed 'dry' sterilisation using vapourised H₂O₂. This latest KHS system replaced an earlier 'wet' alternative based on PAA.

Two areas where system comparisons can be quantified, to some extent at least, are speed and cost. As in its GSK installation, Serac says that output for its aseptic lines is currently at around 600bpm. This compares with Krones where, says Andrew Wilson, installed lines are already running at 800bpm, and current tenders quote speeds of 1000bpm.

Installation costs are more difficult to pin down, especially given the range of equipment and contractual services

provided by each supplier. Serac says that the capital cost of aseptic lines is now between one and a half times and twice the cost of an ESL line (one hygiene level down). Krones, which claims its latest isolator technology helps to cut machinery costs, is clear that the step up from its Ultra grade to full aseptic will involve less than a doubling of installation cost.

UK agent for Sidel Filling Food, F Jahn & Co says that an aseptic line can cost twice and up to three times as much as an ultra-clean line to install, and will almost certainly incur substantially higher running costs.

Ultra-clean and extended shelf life

If Serac led the way in aseptic systems for soft drinks in the UK, it can also be said to have set something of a trend for extended shelf-life (ESL) milk in the UK. The system for filling Arla Foods' Cravendale ESL milk was installed some seven years ago, points out Michel Titera.

This brand-owner quotes a shelf-life of just 30 days, although the ESL system will in fact

achieve a longer life than that, he says. More recently, Dairy Crest and Robert Wiseman have established similar products of their own.

Serac categorises its different filling hygiene levels as: Standard (around 17 days shelf-life), Ultra-clean (with more guarding and CIP options, and offering up to 24 days shelf-life),



Krones: Witnessing move of non-carbonated 'healthy' drinks to aseptic filling

ESL (for 30-60 days shelf-life) and full Aseptic (90 days plus shelf-life).

But the definitions used by different suppliers can be confusing. Sidel Filling Food, for example, grades its equipment in four tiers, from Classic and Select to Ultra and Aseptic, depending on product requirements.

In areas such as dairy and juices, this particular Sidel business places the emphasis very much on the Select and Ultra categories. In fact, it recommends full aseptic filling for only very specific dairy categories, such as enriched UHT milks, soy milks, and some flavoured ESL milks.

Gerry Lupton, managing director at F Jahn & Co, believes that barriers to acceptance of aseptic filling are still widespread in the UK and, unlike some others, sees no signs of imminent change. This is partly for extremely sound cost reasons.

Of course, there are equally good reasons for wanting to extend product shelf-life. "This gives customers a buffer of flexibility when dealing



Sidel ultra clean filler: Experiencing success in the UK with this type of machine

with retailers," says Mr Lupton. "They are being pushed to offer longer shelf-life, but will often balk at the price of aseptic."

One UK customer recently made an enquiry about aseptically filling fruit juice, says Mr Lupton, but it rapidly became clear that ultra-clean filling would achieve the shelf-life required, and for a much lower cost. With the proviso that bottles and caps need to be sterilised before the ultra-clean filling itself takes place, Sidel Filling Food can achieve a 45-day shelf-life. This compares with 90 days for aseptically-filled products.

The French company has already seen some success in the US with its ultra-clean fillers. One example is a tribloc filler-sealer-capper achieving a 45-day shelf-life on drinking yogurts.

Eliminating the steriliser

Krones UK is also seeing increased interest in ESL fillers, where the steriliser is often eliminated, and the containers are rinsed in PAA. Eliminating the steriliser in this way can reduce capital costs further, says Andrew Wilson at Krones UK.

It is not only the costs associated with aseptic filling that can deter potential customers. Changeovers are more complex and time-consuming, with many aseptic lines dedicated to single products for that very reason. There is also a widespread perception that any machinery problems are more difficult to cope with because of the sterile environment.

Then again, if fillers cannot rely on a chill chain, cold aseptic filling may turn out to be the only viable solution.

According to XJL, UK agent for IWKA's Gasti cup-filling lines, demand for aseptic filling in the dairy sector has suffered as a result of the same consumer preference for 'fresh' product that still holds sway in liquid milk.

Nonetheless, sales manager Peter Overton says there are four Gasti Dogaseptic machines installed in the UK, filling dairy cream, non-dairy cream and fruit juices into pre-formed containers. This installed base is, as he puts it, "well-established", with the last machine, a factory-overhauled line, having been delivered around five years ago.

The Gasti Dogaseptic range is not new, but has seen recent enhancements, including a system of H₂O₂ dosing which gives an improved kill rate, and the flexibility to run different pot sizes with less than an hour changeover time, points out Mr Overton.

As well as single product dosing across viscous and liquid consistencies, the Gasti machines can also provide multi-layer filling for products such as puddings and mousses with cream toppings.

The cups and lids are sterilised using 35 per cent H₂O₂ vapour in an enclosed, over-pressure chamber. Hot, sterile air is then used to dry these materials. A multi-stage monitoring system ensures that sterile conditions are maintained at each stage of the decontamination and

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filling process. The filler itself has no moving seals, and offers both CIP and SIP.

Meanwhile, opportunities are starting to open up for aseptic filling in the sachet sector, with Spanish company Volpak taking a lead here. As UK agent Integrapak explains, the emphasis over recent years has been on Volpak's Ultraclean 999 horizontal machine. This has been used in continental Europe to fill smoothies, yogurt drinks and fruit juices. Integrapak says it has recently sold a further two Ultraclean machines for dairy applications.

Prototype for aseptics

But now the focus is on the SM260 L2ESL machine. Integrapak sales manager Michael Lindsay says that, as the name suggests, this is currently classed as an ESL machine. But a prototype has already been bought and installed at an unnamed dairy, "probably filling a yoghurt drink". Up to six months of validation tests are expected to confirm a Log 5 recontamination rating, which will meet aseptic standards.

"The big jump will be in the shelf-life that we achieve for milk," says Michael Lindsay. "The hope is that we will be the first company to provide a viable alternative to the carton for milk."

If the validation period is successful, Integrapak believes the resulting pack will be the first aseptic stand-up pouch from a form-fill-seal machine.

Sceptics may point out that, once again, the concept of long-life milk in sachets has little to do with the current packaging and product preferences of the UK consumer. Similarly, demand for cold aseptic filling as an alternative to currently popular formats and processes in soft drinks and juices will depend on the degree to which 'healthier' options take root in the UK.

But as the example of yoghurt drinks illustrates, there are already niche categories which are benefitting from the technology in rigid and flexible packs. Functional, added-value yoghurt products are a good example of a sub-category, says Serac's Michel Titera, which could easily opt to use aseptic filling to avoid the need for a chill chain.

As the number of working aseptic lines multiplies, end users are seeing the benefits of extending shelf-life, of achieving a 'healthier' image for the product and of safeguarding more subtle flavours. If system costs continue to fall, the technology's attractions can only continue to grow. ■

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