the filling business

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Typically Swiss

When Swiss drinks manufacturer Rivella needed to change to lighter-weight PET bottles for its novel products it took the long-term view with its latest filling line, reports Chris Myers

It's no surprise to learn that Coca-Cola is the most popular carbonated soft drink in Switzerland, but I bet there aren't many people who'd be able to correctly guess the runner-up.

It's Rivella, a health-promoting drink that uses the clear milk product lactoserum, containing lactose, lactic acid and minerals. It gives a distinctive taste that the Swiss love, but one that has found limited favour further afield. Test marketing in the UK and the USA (Florida) was not a success.

Rivella's other line is for Michel, its range of fruit juices, that recently benefited from a CHF 16 million (US$13.3 million) investment in a new aseptic cold filling PET bottling line, a key component of which is the latest Nitrodose liquid nitrogen (LN2) injection system from Vacuum Barrier Systems (VBS), the European company that distributes Vacuum Barrier Corporation (VBC) equipment in Europe.

It's a big investment, and one that demonstrates the typically far-sighted Swiss approach to business, since it comes at a time when Rivella's group chief executive Franz Rieder describes the market as "stagnating". This translates into a 3 percent drop in home sales and tougher conditions abroad, as we have seen.

"Far sighted" and undoubtedly confident they may be, but what exactly was it that made Rivella abandon hot filling for the latest in an aseptic bottling line featuring LN2 injection?

"Besides a more gentle filling process of the fruit juices, which positively impacts taste and quality, we wanted to make our production more efficient thanks the possibilities of this new filling line, which can be used for both carbonated and non-carbonated drinks," said Assistant Engineering Director Marc Taschi.

The 'old' hot-filled product meant thicker walled PET bottles to maintain rigidity.

"This is very expensive," said Taschi. "We were using a three-layer PET bottle — the inner layer was EVOH nylon — and we wanted to reduce our costs as much as possible."

Using thinner-walled, lighter, PET bottles can save several grammes per unit.

Taschi also had his eyes on the future costs of PET and with the typically Swiss eye for the long term, was concerned at the costs of oil-based products in an increasing unstable petroleum market. "Resin costs may be relatively stable now," he said, "but there will be future increases."

But in the end it was the competition that

Sterile: Filling on the new Michel line is carried out in a sealed environment

made the switch inevitable. "Most of our competitors started to use aseptic cold filling in combination with the use of liquid nitrogen and we didn't want to be left behind as customers chose a fresher, more natural product," he said.

Taschi was clear about the inevitability of the switch to new technology and the application of LN2: "I think that if we hadn't made the change, Michel would have simply disappeared. It was that clear cut," he said.

So who are Rivella's competitors for their Michel range? It's Migros, the own brand of Migros, the country's biggest supermarket chain, and the more internationally-known Granini brand.

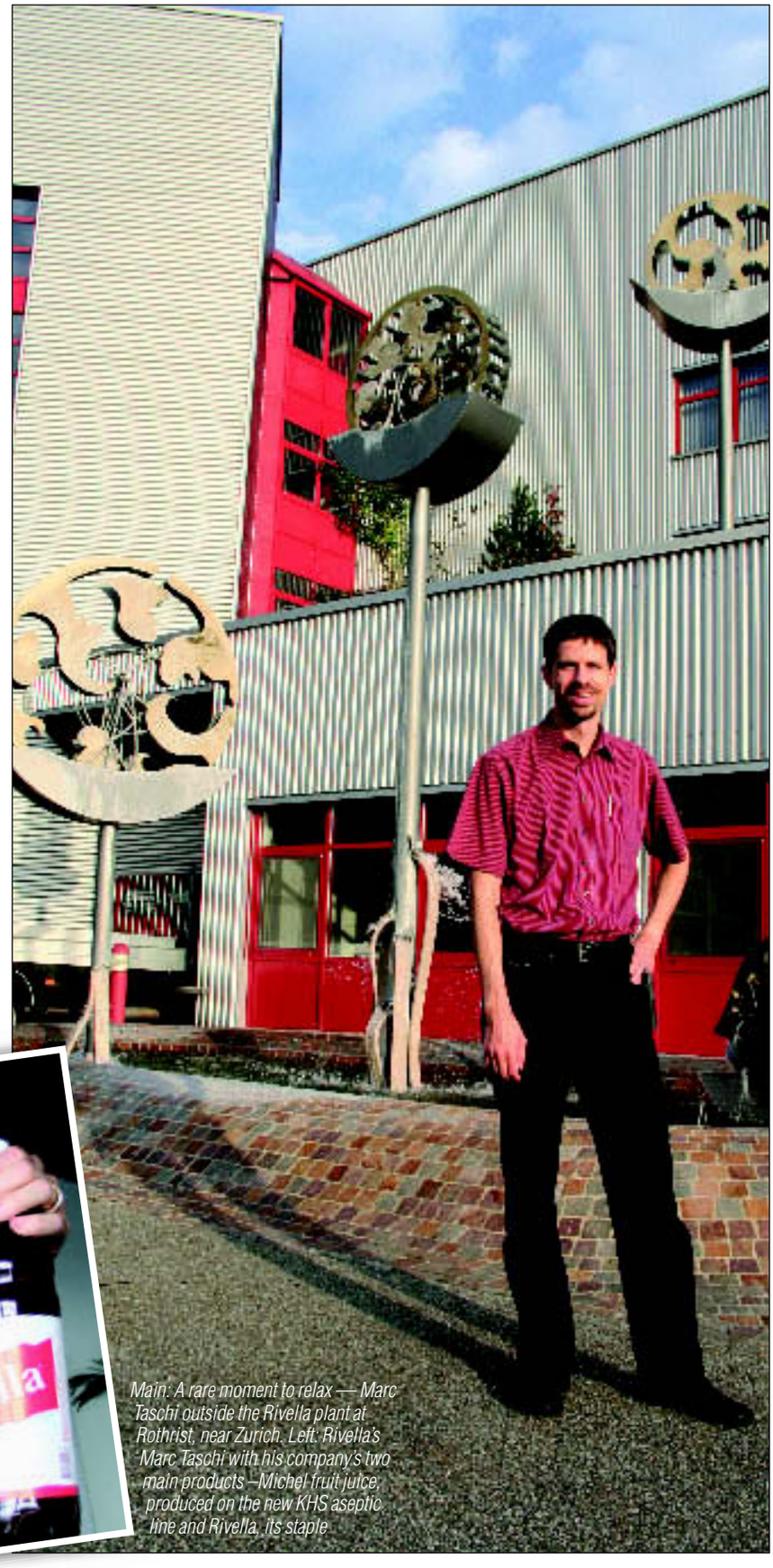
Until the new line came on stream earlier this year, Michel had been hot filled in PET and glass.

Having decided to go for an LN2 solution, Rivella didn't have to look too far to find a supplier. Rivella chose a filling line supplied by Germany's KHS that included the latest VBC Nitrodose HSA LN2 injection system. Like other VBC systems it has a programmable logic control system.

The installation offers reduced LN2 consumption. The unit is stainless steel and the valve cover is well able to withstand high pressure water or chemical clean ups. This is an essential operation on an aseptic line after every production run.

Of course compatibility with the KHS line was important. Main reason for using LN2 was to displace the oxygen in the headspace of the bottles. Furthermore, using LN2 to pressurise the PET bottles allows thinner-walled containers and the internal pressure created allows containers to be stacked several pallets high — an important saving in transportation and warehousing.

VBC is also proud of the insulated piping that connects the unit to the bulk LN2 tank. This is an area where insulation is critical to avoid vaporisation or loss. VBC's piping is



Main: A rare moment to relax — Marc Taschi outside the Rivella plant at Rothrist, near Zurich. Left: Rivella's Marc Taschi with his company's two main products – Michel fruit juice, produced on the new KHS aseptic line and Rivella, its staple

The Michel filling line. Hair covering and protective clothing are still obligatory, even outside the isolated filling area
Inset: Guy Charbonnier, founder of VBS, the European arm of US-based Vacuum Barrier Corp

frost-free because a sophisticated vacuum jacket is used — an annulus closed around the inner nitrogen pipe. The gap is a vacuum to provide the best insulation.

Foam insulated piping may be cheaper to manufacture, but as its heat transfer is 20 times greater than the vacuum barrier, it's an important factor in long-term cost implications. Something the Swiss can't fail to have noticed.

Long-term costs are also very dependent on the accuracy of the dosing system to ▶

Vacuum Barrier Corporation

Vacuum Barrier Corporation (VBC) started out in 1958 advancing the technology in LN2 transfer and handling equipment for several different industries such as semiconductor, electronics and automotive, but the industrial use of liquid nitrogen in canning and bottling has created a big new market for this Massachusetts-based company.

The big break came in 1986 when Coca-Cola (Canada) approached VBC to develop a system to stop their hot-filled Five Alive fruit juice cans collapsing.

The company is now a leader in supplying Liquid Nitrogen (LN2) dosing systems, cryogenic sealed and dynamically pumped bendable piping and associated technology.

Its Nitrodose LN2 injection system for the food and beverage industry delivers discrete doses of sterile liquid nitrogen to the headspace of beverage containers and is quickly sealed in the container. Inside the liquid nitrogen vaporizes and generates a pressure, improving durability and handling. Nitrodose is also used in inerting food packages such as peanuts, oils, to remove the oxygen from the headspace and extend shelf life.

Nitrodose is claimed to provide the most accurate and high purity dosing, allowing consistent pressure from package to package, at all line speeds. In addition to pressurizing bottles and cans, the systems are used in PET bottles and thin wall cans to extend product shelf life, colour retention and eliminate panelling.

ensure that the bottles get the right shot and nitrogen is not wasted between bottles. The line at Rivella is designed to give a consistent head space so that the sterile LN2 dose — typically 0.0014 fl oz — provides the correct and consistent pressure.

Erratic pressures are not only wasteful, but could be disastrous — over-pressurised bottles can jam machinery, or possibly explode in storage. Too little pressure could mean spoiled product or a collapse in storage and so create expensive waste.

Rivella planned extensively for the switch from hot-filling to the aseptic line, but even so Marc Taschi admits that it underestimated the investment in training — and time to perfect its systems — that was needed.

It began installing the new line and dosing kit at the beginning of 2005 and planned to go live in June. In the event the first bottles of nitrogen-dosed Michel drinks didn't start coming out of the plant for sale until beginning of October 2005.

It was a delay that cost the company. Production of Michel was affected as a result.

Marc Taschi is refreshingly honest about the reasons for what, in hindsight, turned out to be an over ambitious deadline.

"It was always clear that specific hygiene was something we would have to invest in heavily and it was this area that we were too ambitious about," he admitted.

"With the hot filling, it was a simple process. Now things are very complex with an aseptic line — the entire filling line has to be sealed and we have to avoid any step that could be dangerous for the product. We had to hire new, more highly-trained personnel and also to set up more training for our own staff. VBC and KHS were helpful to supply the training.

"The new process itself is more expensive," admitted Taschi. "We use more energy to pasteurise the juice and sterilise the water. The chemicals used in the sterilisation and to clean the filler are another additional cost.

"But the result is a bacteria free, top-quality fruit juice with an extended shelf life. On top of that we save money on thinner-wall bottles."

"But the most important thing is that we now have a very competitive, premium product that can compete on the market," he says. "We are marketing it as 'traditional Swiss'."

The new Michel line runs at 30,000 bottles an hour for the 33cl bottles, adding 20 percent more capacity to the factory.

There has been no price increase in Michel, but new shrink-wrap labelling emphasises the premium and fresh nature of the new product.

With the size of the investment, it might be thought that Rivella would be looking for a big export drive for Michel. But that would be wrong. Their efforts are being concentrated on selling the product in the home market.

Control systems for the KHS Michel fruit juice line are part of the package

Rivella says the export markets are too tough in this sector. "The export market in the segment is dominated by the discounters, so it's not right for us," said Taschi.

"We prefer to concentrate on the home market and win market share with our new premium product and better marketing."

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Rivella International Inc

Rivella's main business comes from its Rivella brand carbonated soft drink with the same name. It's the second most popular soft drink in Switzerland.

Its unique quality comes from the wholesome lactoserum it contains, produced from whey — the clear component of milk — and so includes lactose, lactic acid and minerals.

It contains no preservatives or artificial colours, requiring sterile conditions and packaging in the filling process.

Rivella comes in three varieties: the original version, a low-calorie beverage and a variety aromatized with valuable green tea extracts.

Rivella's other business is its Michel fruit juice range which is mainly for the Swiss home market.

Rivella was created and founded by Robert Barth in 1952. Its main market is Switzerland, but it is also sold in The Netherlands, Luxembourg, southern Germany, eastern France and western Australia.

PET and glass bottles are used for Rivella in different flavours marked by coloured labelling. It comes in three varieties: Red, the original version; Blue, a low calorie version; and Green, with green tea extract, the most recent version, introduced in 1999.