FOCUS ON

BOTTLE PRODUCTION EQUIPMENTS FOR SPECIALTIES

PET PACKAGING NEWS OF THE WORLD

SIPAMAGAZINE

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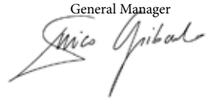
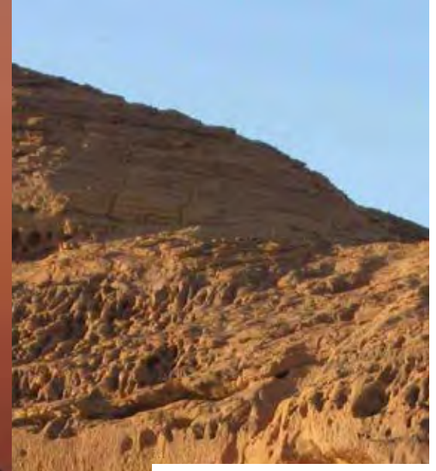
SUMMARY

EDITORIAL

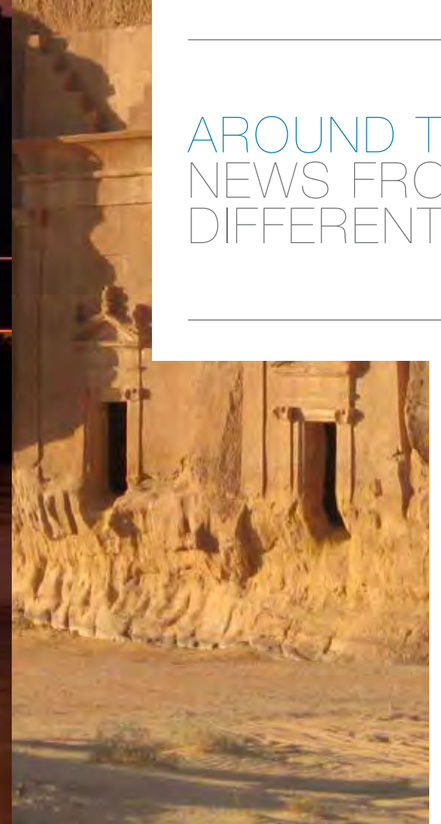
I recently had the opportunity to visit the Expo 2015 Universal Exposition in Milan. This enormous event, with exhibits from 145 participating countries, is being held under the theme "Feeding the Planet, Energy for Life." While I was walking around, I was struck by a quote printed on the Irish pavillion walls: "We did not inherit this world from our parents, we borrowed it from our children. One day we will return it to them. When we do, it should be every bit as bountiful it was when we found it." I believe that each and every one of us has an obligation to honour this principle. Any parent, in moments of contemplation, may wonder how they can help to preserve and protect this fragile planet for generations to come. So often, industry is seen as a negative force, and technology as an agent of alienation. We have to counter this notion: we have to harness industry and technology to enhance our environment, not damage it. Packaging is a two-edged sword. So much is said about how thrown-away packaging is damaging our countrysides and oceans, and how excess packaging is a drain on resources. We in the packaging industry know that littering is much more a problem of poor education (and criminal activity) than poor packaging, and we must counter any arguments that lead the public to think otherwise. One way to do this is by demonstrating the numerous environmental benefits offered by PET technology. We all know that with the fall in the price of oil, as well as the growth in global capacities, PET is considerably less expensive than it was. Cheap oil has led some people to pay less attention to lightweighting, but that is a mistake. The need for lightweighting is just as important now as it ever was, and indeed probably more so. And SIPA plans to stay in the vanguard of efforts to reduce the weight of PET packaging. But we are also looking at new and better ways to increase the intrinsic usefulness and value of PET packaging. In this edition of SIPA MAGAZINE, we are shining the light on new and specialty applications for PET, and how SIPA is actively seeking ways to cover these niches. We look at how numerous customers around the world are implementing SIPA technologies to create new and better consumer products. And we also consider new ideas being developed at SIPA to extend the use of PET packaging into new areas that we believe will provide new opportunities for our customers, improve the consumer experience, and create enhanced packaging solutions. We consider the growing interest, for example, in exceptionally light PET collapsible bottles for HOD dispensers, and how SIPA is using its design expertise to help customers create new bottles that fold in on themselves as they empty, saving valuable space when their first life comes to an end. We also look at how improved understanding in materials flow has led to a new generation of molds that help customers increase process efficiency. We look too at the growing interest in producing carbonated soft drinks free of preservatives. We need to work harder to create new containers that combine the best aesthetics with the highest functionality, and we need to find new ways to improve our manufacturing systems to minimize the environmental footprints of our processes and the products that we make. To coin a phrase that is somewhat more well-worn than the one I quoted earlier, "less is more." I believe that SIPA has gone a good way to achieving these objectives, with new developments that help our customers achieve major savings in utilities. Our XFORM injection molding systems, for example, are leaders in energy-efficiency; our SFR EVO^3 stretch-blow molding system uses much less high-pressure air than earlier systems and has very 'lean' ovens; with our X-Mould technology, it is possible to create ultralight preforms that save significant amounts of energy during processing; and our XTREME injection-compression technology is another major materials and energy saver. All along the value chain, there is a strong need to develop and invest in new, more cost-effective, more beneficial process technologies that will benefit consumers and, in the end, the environment. Let us show our children, and our children's children, that we can develop and use technology, not just for technology's sake, but for the sake of all of us.

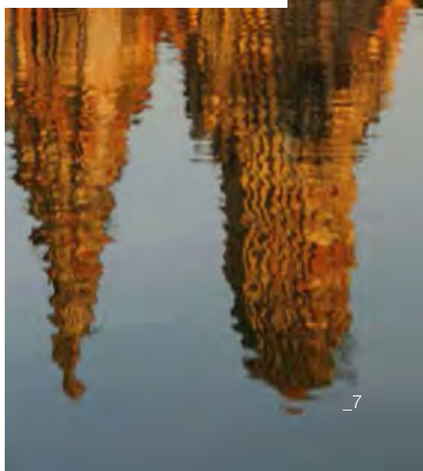
Enrico Gribaudo
General Manager





AROUND THE GLOBE:
NEWS FROM THE DIFFERENT CONTINENTS





TOP UK PET CONTAINER MAKER BOOSTS OUTPUT WITH NEW STRETCH-BLOW UNIT FOR JARS FROM SIPA

The largest independent converter of PET in the UK has just expanded its container production capability, with the addition of a high-output linear stretch-blow moulding system for jars from leading PET processing technology specialist SIPA. Esterform Packaging, headquarters in Tenbury Wells, England, produces an extensive range of PET preforms, bottles and jars for drinks, foods, household, garden and car-care applications. It is currently in the middle of a major expansion program.

Last year, it announced a significant increase in its preform production capacity (located at a second site in Leeds) and now it is also extending finished container capacity, with the addition of a SIPA SFL 4/4 WM unit dedicated to the production of jars for food.

The new SIPA system, which was installed in March, will provide Esterform Packaging with significantly improved capability in high-volume two-stage production of PET food jars. Until now, most of the company's jars were produced on lower-volume single-stage injection-stretch-blow moulding units, as well as on a two-stage

PET jars produced with SIPA SFL 4/4 WM blowmolding machine

unit from another supplier.
PET jar sales had significantly increased, which prompted the purchase of a second two stage jar blowing machine.
The SFL 4/4 WM (WM stands for Wide Mouth) will make 360-mL jars with 63-mm neck finishes. With four cavities, it is capable of producing up to 6000 jars every hour. The complete system installed by SIPA also includes a set of blow moulds, a preform unscrambler, a "soft-drop" octa-bin preform dumper and an Air Recovery System for improved energy efficiency.
Esterform Packaging opted for SIPA for its upgrade for several reasons. "The customer told us that our preform unscrambler, preform infeed, oven, preform transfer system and blowing process are key improvements compared to their current line." says Mauro Fibbia, Account Manager at SIPA. "The SFL 4/4 WM has a wider process window and higher output than the current line, making the same jar from the same preform.
Esterform appreciates the well thought-out design of our preform unscrambler as well."
Darryl Gunn, Technical Manager at Esterform Packaging adds that Esterform Packaging was also impressed by SIPA's project management and field activities. "Overall, we found SIPA to be the best solution for our needs on this project," he says.

Darryl Gunn, Technical Manager in front of SIPA SFL 4/4 WM machine

SIPA HELPS POLYOAK POWER THE BOS RED BUSH REVOLUTION IN SOUTH AFRICA

Long-standing South African customer Polyoak Packaging has turned to SIPA once more for the development and production of small bottles for one of the country's favorite ice teas, BOS.
Polyoak is one of bigger packaging converters in South Africa, with over 30 manufacturing plants around the country (as well as in neighboring Namibia and Zimbabwe). Its PET bottle production operations are looked after by its Polypet division, which has been using SIPA equipment since 2007. Polyoak now has a large fleet of SIPA injection molding systems for production of PET preforms in both Cape Town and Johannesburg, as well as a fleet of stretch-blow molding systems covering Cape Town and Durban.

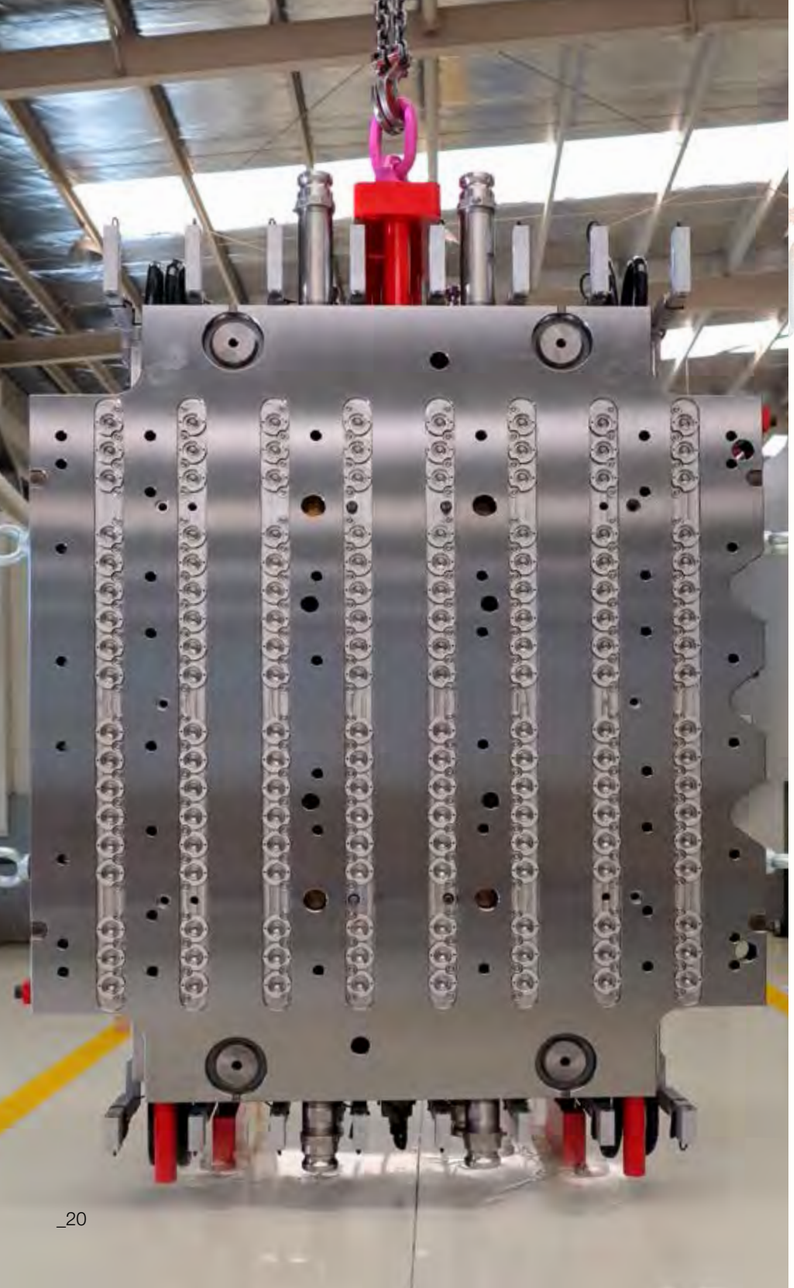
One of Polyoak's customers for PET bottles is BOS Brands, which five years ago burst onto the local market with a range of premium quality ice teas that contain extracts from the Rooibos plant native to South Africa.
Rooibos means "red bush," and in some areas herbal tea made from Rooibos leaves is actually called redbush tea.
Since hitting shop shelves in 2010, BOS ice tea has become very popular in South Africa, and is now on sale in most retail outlets across the country.
BOS is also increasingly available overseas. The range continues to expand, and is now available in a wide range of flavours and in various formats (cans, packs and bottles). BOS recently decided to revitalize the 500-mL PET bottles for its BOS SPORT, and SIPA worked closely with Polyoak to deliver the goods.
The new format has a hot-fillable design. SIPA carried out pilot development to optimize the weight of the bottle and also to make sure the new design answered all the esthetic demands of the final customer. BOS was very keen to have a new container that made

their drink stand out from the competition on the shelves.
With the green light from BOS, a SIPA unit has been converted to produce hot-fill bottles, and production of the new bottle recently got underway.
“Polyoak appreciates the flexibility of the SFL system,” says Roger Kerr, Operations Manager at Polyoak. “One of the key reasons we chose SIPA was because of the ease with which the equipment can be quicky set up during our frequent format changes.” Polyoak appreciates that commercial success of its customers is often a function of how quickly they can respond to consumer demand. They partner with market leading brands as well as more niche, emerging brands with smaller initial volume.
This means we need to be flexible and efficient in changing between different products”.
The SIPA SFL system also has the important advantage of using very cost-effective molds (made by SIPA). “The customer also greatly appreciates the assistance we provided in designing the new packaging,” says Giovanni De Rosa, General Manager at SIPA South Africa. “And of course, now that we have our own sales and service operation in South Africa, we are close to Polyoak to provide continuing technical support. We have technicians paying regular visits to Polyoak plants in Cape Town, Johannesburg and Durban.
“Polyoak has been using our equipment for many years to make cold-fill bottles between 200 mL and 3 L for juices, soft drinks and water, and now it is confidently entering hot-fill territory for the first time and it is doing it with us!”
Polyoak Packaging is a privately-owned South African company with almost 40 years of experience in the industry.
It is a true ‘one-stop packaging shop’ offering support with everything to do with rigid plastic packaging for dairy, beverage, food and industrial applications. This covers bottles, preforms, closures, buckets, drums, tubs, and garments hangers.
The service includes packaging design, mould manufacture, testing services, rental of filling equipment and technical support.

A BOTTLE FOR ALL SEASONS

Major Chinese beverage company Nongfu Spring is making a name for itself in PET bottles with exquisite designs.
In a previous edition of SIPA MAGAZINE, we discussed how SIPA helped the company develop bottles shaped like whisks, for packaging a new range of teas. Today, we are talking about small - but perfectly formed - mineral water bottles.
What makes these bottles really stand out is the most beautiful labels. There are four different ones, each representing a season of the year. But to maximize the impact of the labels, which are nothing less than miniature works of art, Nongfu Spring wanted to set them on the purest canvas - or rather a flawless crystal-clear PET

From left: Mr. William Pasquali, Genaral Manager SIPA Machinery Hangzhou, Mr. Zhong Shanshan, Nongufu Spring owner, Michael Sun Weibin, SMH Moulds Sales Director



bottle of the most simple and delicate structure.
SIPA rose to the challenge with input on preform development and injection molds.
The tool shop at SIPA Machinery Hangzhou is ideally equipped for jobs of this type, with its extensive capability in mold construction and refurbishing.
Nongfu is producing the bottles in three different sizes: 330, 535 and 680 mL.
SIPA has developed and delivered changeover sets for preforms for the smallest and largest bottles (weighing respectively 22 and 34 g) and a complete cold half for the medium-sized bottle, all within a very short delivery time. In all three cases, SIPA has also produced end-of-arm tooling (EOAT) and Airpik to fit on the automatic take-out system.
"The bottle designs had to be very 'clean,' with no ribs or panels, and that could only be achieved by using special technology in the design of preform molds," says William Pasquali, General Manager of SIPA China.
"We also needed to work hard to create a mold that would enable production of preforms - and bottles obviously - with utmost clarity. And of course, everything had to be delivered yesterday!
I think the finished results provide ample proof that we came through with flying colors!
Because there are no ribs or panels on the body of bottle, the average wall thickness has to be higher than on regular bottles in the market, Pasquali says. "Otherwise, the vacuum resistance will be not good enough, and the result would be a short shelf life.
"That provides quite a challenge in terms of cooling for the preform molds, because it's much more difficult to cool down a thick preform and still have a 'normal' total cycle time."
SIPA met this particular challenge by creating cooling channels with a much larger cooling surfa-

ce than is normal. Lifetime of the components is still guaranteed, even though with the larger channels there is less steel in the mold, which affects structural strength. Nongfu is very happy with its new bottles. In fact, it awarded SIPA a “special contribution” award for its work on the project.

AROUND THE GLOBE - CHINA

HANA WATER MOVES INTO NEW BOTTLE FORMATS WITH SIPA

Saudi water bottling company Hana Water in Riyadh (Qassim) has taken delivery of a complete line from SIPA for production, filling, packaging and palletizing of several types of container that will expand its product offering for markets in the Gulf region. The line, delivered on a turnkey basis, is already producing and handling containers from 3.5 L in size (square with hand grip), through 5-L types, to 12-L water cooler bottles, some of them with innovative designs co-developed by the two companies. Until recently, Hana had concentrated on smaller bottle sizes, up to 1.5 L.

The line is designed for high speed and high efficiency, as well as flexibility, to meet a range of customer requests. It is composed of an SFL6/6XXL linear bottle blowing system, filling monobloc, two capping stations – one for screw caps, one for press-on types, a labelling station, a unit for applying bottle neck handles to 5-L bottles, a wrap-around carton packer, palletizer, and finally two pallet stretch wrappers for different wrapping applications.

Hana intends to add another SFL2/2 stretch-blow molding unit to the line quite soon, to give it the capability of producing one-way PET containers for water coolers and dispensers in 4 and 5 US gallon sizes.

During the initial phases of the project, a Hana team worked with SIPA to design a new family of bottles that Hana wanted to be attractive, innovative (the new 3.5-L bottle has an “easy-grip” shape for example),very light, and overall highly cost-efficient. “It was

a smooth process," says Sheikh Ahmed Altheyab at Hana. "SIPA has been cooperating with us for many years to bring innovation to the design and engineering of our bottles, so we know how to bring the best out of each other."

All Hana's current water bottles have in fact been designed in collaboration with SIPA, and most are produced using SIPA molds. SIPA has also produced original preform injection molds for the company, and converted others.

"SIPA is a leading company in the business of equipment for bottling in PET," says Sheikh Ahmed Altheyab at Hana Water.

"It turned out to be the best choice especially for large bottles sizes, where it could deliver the complete package from designing the bottle to complete line manufacturing."

Sheikh Ahmed Altheyab adds: "Over the many years that our two companies have been working together, we have also come to appreciate SIPA's good after-sales set-up in this part of the world, and that makes them a reliable partner for a leading company like Hana."

Roberto Sommi at SIPA says the new plant, with its ability to produce 6000 5-L bottles every hour from a single stretch-blow molding station, is very fast and at the same time very versatile.

"We think it is very impressive that a single line can produce bottles of quite different shapes and sizes, and also apply standard screw caps and snap-on closures for dispenser/cooler application," he points out.

Hana was established over 35 years ago, and has a unique position in the local market with its access to natural underground Deep water wells. It is one of the most prestigious bottled water plants in the Middle East region. Its operations have very high yields, in line with the best production lines in the world.

HIGH ON A HILL…YASAR TURNS TO SIPA FOR MARSU MINERAL WATER

Yasar Dondurma Ve Gida Sanayii is particularly famous in Turkey for its highly distinctive Mado ice cream, made from goats' milk. Now, the company - the name translates into English as Yasar Ice Cream and Food & Beverage Industries - is also making a name for itself in natural spring water.

In fact, if you go into one the 250 Mado restaurants and coffee shops across the country selling its ice cream, you will also most likely find bottles of its Marsu mineral water. The bottles are blown, filled, packed and pelletized on lines supplied by SIPA.

Water for Marsu comes from the Arkit source, situated at 1213 meters on the Ahir mountain in Kahramanmaraş province, famous for its highland wilderness and gurgling streams. The water is very pure, highly oxygenated, and has an excellent balance of natural minerals. The source is also not far from the company's own goat farm, which produces the milk for its famous ice cream.

Yasar has been operating three new SIPA lines at the Mado plant in Tekir, close to the Arkit source, since April 2014. The first two are complete PET lines, one for bottles in sizes of 0.33, 0.5 and 1.5 L, the second for bigger bottles, 5 and 10 L in size. The first, capable of an output of 40,000 bottles per hour, starts with an SFR

20 rotary stretch-blow unit in a Sincro Bloc set-up with a Unitronic P 70-20 filler; the second, with a maximum output of 6000 bottles per hour, also has a Sincro Bloc, comprising an SFL 6/6 XXL linear stretch-blower and a Bigfill 18.6 filling system. Both lines also use SIPA molds. Additional equipment supplied by SIPA includes water chillers, semi-automatic CIP cleaning sections, labelling units, shrink packers and automatic pelletizers. SIPA also installed a complete glass bottle filling line for Yasar. Also capable of handling various bottle sizes, this uses a Genius depalletizer for the empty bottles and a Genius palletizer for the full ones. In between, is a Unitronic-V 20.20.6 filling and capping block, a labelling unit, and a carton packer. Output is up to 10,000 1-L bottles per hour.

"Sincro Bloc is the ideal solution for operations where reduced square footage is the primary requirement, thanks to its extreme compactness and small overall dimensions," says Betul Boz Yoney, General Manager of SIPA Turkey Branch. "It can handle a wide range of bottles, necks and cap sizes, and changeover times are very short. It needs

no air conveyors, which keeps down running costs and energy consumption. Only one operator controls the whole system.

The preform treatment system, the short connection between blowing and filling, and the overpressurized environment all serve to guarantee a high hygiene level. The lines in Marsu plant have been running with high efficiency ever since they started up."

Marsu Plant Manager Mrs. Meltem Kirazli says that she knows SIPA for a long time in the Turkish market. "SIPA is a company who can provide all the machinery we need for our products which are the blowing, filling and packing of small format PET containers, big format 5 l PET containers and also complete glass line starting from glass bottle depalletizer till palletizer of filled products. That's why we preferred to cooperate with SIPA. Besides, we have been watching closely how SIPA has gained a very wide range of experience in both container design and machine development, so it was quite an easy decision for us to select SIPA as our main partner for this new high-capacity mineral water bottling plant investment," she says.

"All SIPA machines provide us a very flexible and efficient production capability."

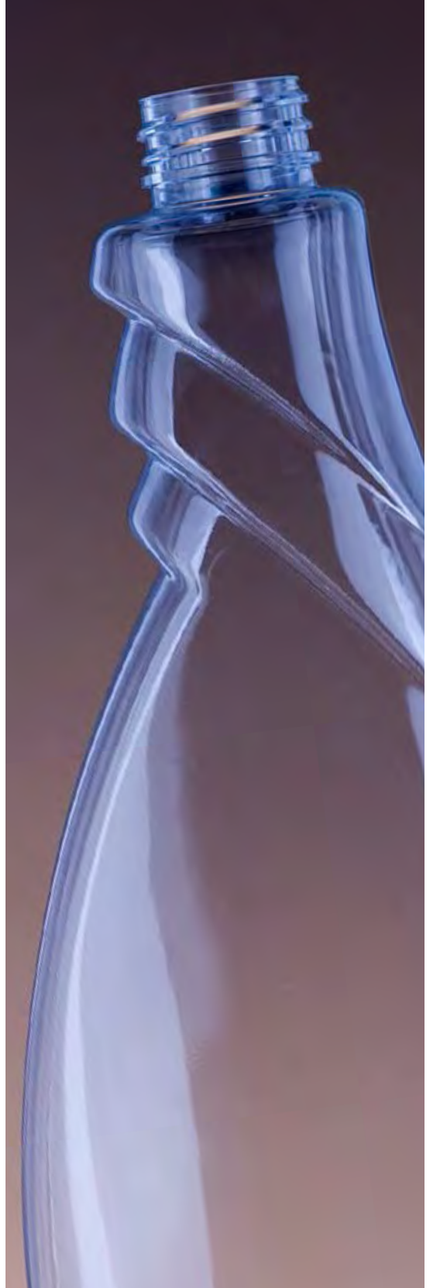
PETPAK RESPONDS TO GROWTH IN PET PACKAGING MARKET IN THAILAND WITH NEW XFORM 150

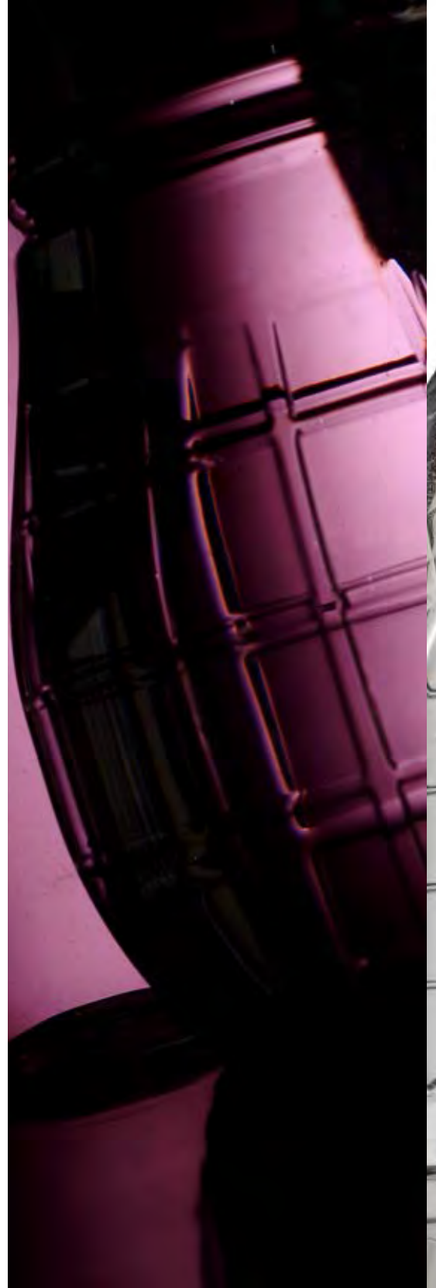
Thai packaging converter Petpak Co. is one of the latest companies to take advantage of SIPA's XFORM technology for high-efficiency production of PET preforms. The company recently took delivery of a hybrid electric XFORM 150 - the smallest in the XFORM range injection molding systems - for production of 13.5-g and 28.5-g preforms for mineral water bottles. In both cases, it is using 48-cavity molds, also produced by SIPA. It is producing around 150 million preforms a year, the bulk of them the smaller types.

Adisak Sukprasert, General Manager at Petpak, says the company chose SIPA for a host of reasons: "We looked at production technology, production efficiency, maintenance costs, energy consumption and total manufac-

turing costs, and we looked at how the capacity of the system would meet our requirement," he says. "SIPA was the obvious choice.
This is a world class brand." Petpak has in fact been using another 48-cavity PET preform system from SIPA for some time.

The XFORM 150 stands out as being flexible, energy-efficient, and easy to install, says Weera Eiamrattanawong at SIPA. "It is ideal for frequent mold changes and special preform production. With its electrically-driven two-platen clamp unit and its two-stage extruder/shooting pot injection system, energy efficiency is excellent. Neither servo-valves nor oil accumulator are necessary on this platform."
The XFORM 150 also features outstanding platen parallelism, wide tie bar spacing and sensitive mold protection. As with all XFORM machines, it accepts legacy molds from all leading mold manufacturers. It is engineered for quick and easy mold changeovers, so the time between production of one type of preform and another completely different one can often be under an hour.
Petpak produces PET preforms and bottles for various food and non-food applications.
It is owned by Bangkok Glass, which has a 60% share in the company. Other participants include bottling company Thai Nam Thip, major Thai beverage producers Sermsuk and Green Spot, closures producer Crown Seal, and packaging major Toyo Seikan.
Last year, Petpak, whose main plant is at its headquarters in Ayutthaya province, responded to the growth in demand for PET packaging in Thailand with the opening of a second manufacturing base for preform production in Suratthani in the south of the country. This is where the new XFORM 150 has been installed.





FOCUS ON:
BOTTLE PRODUCTION EQUIPMENTS FOR SPECIALTIES

SIPA SINGLE-STAGE AND TWO-STAGE TECHNOLOGIES COVER ALL THE BASES IN SPECIALTY CONTAINER PRODUCTION

With the addition of two smaller models to its ECS range of single-stage injection-stretch-blow molding (ISBM) machines, PET packaging technology specialist SIPA has further improved its position to provide a full service to companies producing specialty containers in all shapes and sizes, whatever the output requirement.
The new ECS SP machines, ideal for production of containers as small as 20 mL, complement ECS HS and FX models that are particularly suitable for high outputs of wide-mouth jars, oval containers, and other out-of-the-ordinary products. In fact, these units have the highest output on the market for any integrated ISBM system.
These extremely versatile systems can produce ultra clean bottles, pasteurizable containers, warm filled bottles, wide mouth jars, round or square shaped bottles, oval, asymmetric or tailor-made containers. The FX model can even simultaneously produce containers with different sizes and/or shapes.
Whatever the machine, processors will be able to call on expert assistance from SIPA's own Bottle Development Department to create new products for their own special markets.

DEDICATED PREFORMS FOR COST-EFFECTIVE PRODUCTION

Single-stage machines are particularly cost-effective when it comes to production of specialties. Because preforms are blown as soon as they are molded, the systems allow significant bottle weight reductions. The ECS integrated process allows producers to make dedicated preforms in order to obtain the optimum characteristics (thickness, diameter, height, etc.) for the particular size and application of the finished container. SIPA's experts can work with customers to create the best possible design.
ECS systems have also been shown to be extremely versatile in processing materials with very different characteristics compared to standard PET, including PEN, PLA and OPP.

FOR LOTS SMALL AND LARGE

The new ECS SP 50 and 80 are ideal for production of small lots of containers with various designs and characteristics, for such markets as detergents, pharmaceuticals, personal care, and foods. They can also make the miniature

drinks bottles used by airlines for their light weight and break resistance. Meanwhile, HS and FX types are increasingly used for such products as wide mouth jars, oval and asymmetric containers.
It is possible to produce containers with a wide range of capacities, threads and neck finishes. For oval and asymmetrical containers, SIPA offers different technologies for the preferential heating of the preforms to ensure optimal material distribution.
Outputs up to 30,000 bottles/hour are possible.
SIPA's ECS platform can produce any type of container for sensitive products to be hot filled at the required filling temperature with some of the lowest running cost

achievable in the market. SIPA was in fact the first systems provider to introduce the amorphous reinforced neck for hot fill applications without the need of the traditional crystallized neck, thus reducing dramatically the container production cost.

IDEAL FOR COSMETIC CONTAINERS

SIPA also sees strong prospects for making inroads into the prestigious market for very high quality small bottles for cosmetics and beauty care products. It recently developed prototype cosmetic containers varying in volume from 200 mL to around 475 mL in round, oval, and rectangular shapes, with striking designs to complement their target contents. ECS machines

stand out for their ability to produce bottles with high aesthetic qualities. This is due in large part to the fact that preforms are kept separate from one another throughout the process, eliminating any chance of their surfaces being damaged as they touch each other. Any rub marks or scratches on preforms are often very easy to see in the blown bottles. “Scratches are simply not permitted in this sector,” says Pietro Marcati. “The image of the product depends on a perfect presentation.”

TWO-STAGE TECHNOLOGY IS VERSATILE TOO

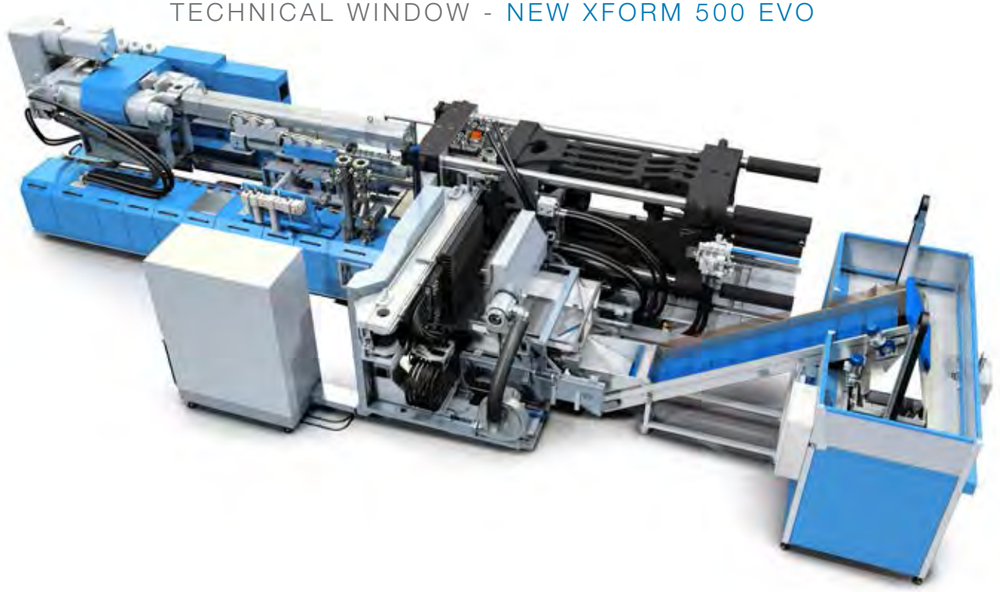
For customers who prefer two-stage technology, SIPA also offers SFL linear stretch-blow molding units as well as XFORM injection molding systems. XFORM systems can be used to produce specialty preforms with narrow and wide necks (up to 120 mm diameter) that complement the characteristics of the SFL units, which themselves are capable of running with molds with as few as one cavity (for extra-large containers up to 30 litres) and as many as six (for containers up to 3 L or, with the SFL 6 XXL model, 6 L), for beverages, edible oils, and detergents.

SFL stretch-blow molding equipment is in operation at SIPA customers all around the world. Processors appreciate it for its wide processing window, its ease of use, its production stability, its energy efficiency, its low cost of maintenance, and its ability to produce a broad range of container types, including oval shapes and hot-fillables.

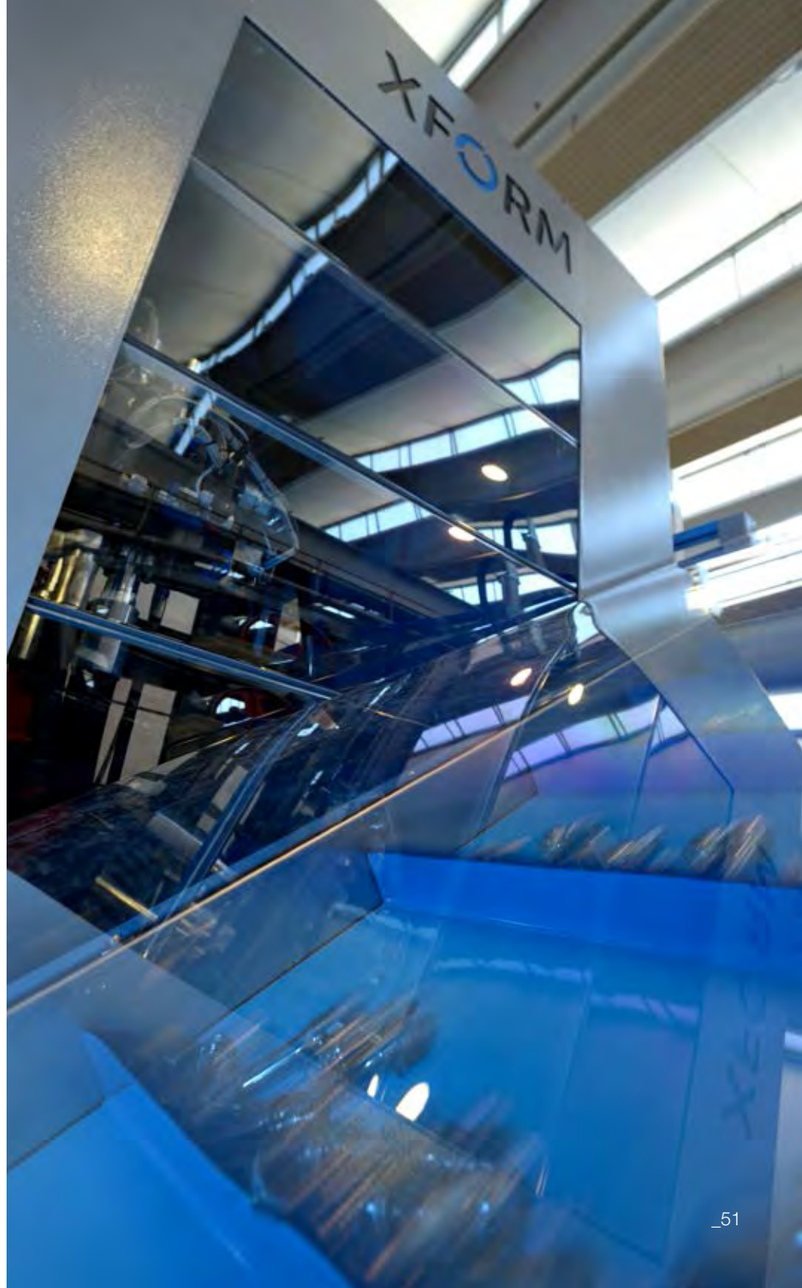
TECHNICAL WINDOW ON SIPA PRODUCT PORTFOLIO: LATEST DEVELOPMENTS

SIPA UPGRADES XFORM 500 HIGH-VOLUME PET PREFORM INJECTION MOLDING SYSTEM

SIPA has introduced additional improvements to automation on its XFORM 500 preform injection molding system.
They will enable processors to raise productivity beyond the already high levels possible with the XFORM 500, which accepts molds of up to 144 cavities, and which has quickly gained a reputation for its dependability, flexibility and overall high cost-effectiveness.
The XFORM 500 was unveiled three years ago at NPE 2012 in Orlando, Florida. It stands among the leaders in terms of speed, with a dry cycle time of 1.6 seconds or better on a 400-mm stroke.
Units are now in operation at customers around the world.



SIPA is particularly proud to have recently sold systems running 144-cavity molds to preform makers in Latin America, North Africa and Central Asia.
SIPA is among a highly select group of global equipment suppliers offering preform injection molding systems capable of handling these very high cavitation molds.
Even fewer companies are in the position to produce the molds to go with the production systems. SIPA is in fact one of the leading PET preform mold makers in the world. Processors can now benefit from the XFORM 500 in its EVO version. This features a new high-speed cooling robot, which provides the most effective cooling yet of preform body and neck, helping processors to cut cycle times while improving dimensional consistency in the product. The improved cooling system is particularly effective on preforms with thicker walls.
SIPA's own end-of-arm tooling (EOAT) can be configured with three or four cooling stages, and functions without a typical source of maintenance downtime, the photocells normally installed in standard EOATs. This is because the new design incorporates much faster communications that make it possible to check the cooling tube while the EOAT is moving below it. The new EVO robot also accepts legacy EOATs, increasing even further the flexibility of the machine and eliminating additional costs for the user.
Cost of ownership of the XFORM 500 is the lowest of any machine in its class. Initial investment costs are especially low for processors with an existing park of preform molds. Low maintenance, high efficiency, and water consumption that is lower than any rival, all help to minimize running costs. Mold wear is very low, thanks to such features as the robust construction of the double-toggle clamp unit and its even clamp force distribution: several customers molds running that have already gone well past 10 million cycles on this platform. The XFORM 500 boasts the lowest platen deflection in the industry. Machine operators and maintenance staff will appreciate the ease of access to the mold area for inspection and component replacement.
On the injection unit side, the XFORM 500 uses the classical configuration of a continuously running extruder feeding a shooting pot. The very low screw rotation speed ensures that material stress is low and there is only minimal reduction in intrinsic viscosity. Up to 50 percent of recycled flakes can be incorporated into the feedstock without the need for any modifications to the standard plasticising group.
The XFORM 500 can be fitted with either a 120-mm or 140-mm extruder, with respective outputs of 800 and 1200 kg/h.



FILLING LINE VERSATILITY TO THE MAX TO MATCH NEW MARKET TRENDS

New market trends and the long shadow of possible new European legislation limiting use of artificial preservatives in food and drink are leading SIPA to develop of new systems in bottle filling lines that provide maximum flexibility at the same time as improved sanitation.
It is now possible for SIPA filling lines for carbonated soft drinks (CSD) to operate without the need for any form of artificial preservatives. With next-generation lines for liquid preparation and filling, it is also possible to fill CSDs at ambient temperature (18°C): energy savings can be appreciable.
Meanwhile, to provide bottling companies with improved flexibility, it is now possible for a single SIPA bottling line to be configured for a wide range of products, whether they be CSDs or hot-fill products, with or without pulp.

GOODBYE PRESERVATIVES

The idea of being able to do away with chemical preservatives for drinks is one that has always generated a lot of interest in the food and beverage industry, as well as among consumers.
On the one hand, there is the cost issue, and on the other there is the desire for more “natural” food products.
SIPA has been studying various aspects of its filling line equipment that will facilitate the elimination of such preservatives. On its Sincro systems, for example, various options are now available to maintain the cleanliness of PET preforms between the injection molding machine and the stretch-blow molding unit:

- the collection hopper, lift and slide can all be enclosed and subject to over-pressure to keep out dust;
- preforms can be treated with UV radiation or pulsed light to eliminate any possible contamination;
- preforms can be blown with ionized air and subject to ventilation to remove possible dust;
- special ventilation filters can be installed in the reheat oven area.

Various enhancements can also be made to ensure that the filling system is extremely clean and easily sanitized, with advanced cleaning systems for both the production circuit (Clean-In-Place, CIP) and the total filling

XTHERM flexible pasteurizer

environment (Clean-Out-of-Place, COP). Automatic dummy bottle loading, together with the use of microbiological isolator around the immediate filling area, produce a drastic reduction in the space that needs to be kept under control, making it possible to use sanitizing systems that are highly cost effective. Isolator can also include the transfer module between the blower and the filler. With a pressurization system with HEPA (High-Efficiency Particulate Arrestance) filters, a separation between the air in the "dry" zone (where the blow molding unit is located) and the "wet" zone (the filler) can be guaranteed. Furthermore, contamination of closures can be minimized with the use of a peroxide washing tunnel.

PRODUCT PASTEURIZATION

As for preparation of the filling product itself, SIPA has developed a flexible integrated pasteurization system made up of the following components:

- **Xblend** multicomponent de-aerating and mixing unit;
- **Xtherm** pasteurizer, available in two different versions, flat and tubular, for products with or without pulp or particles;
- Degasser with aroma recovery;
- **Carbo-SD** carbonation unit.

FLEXIBLE FILLING VALVES

SIPA's multi-product filling valve concept finds perfect form in the **Flextronic C** multi-product volumetric filling monobloc. Flextronic C is suitable for filling CSDs, still and sparkling mineral waters, cold- and hot-fill juices. The configuration of the valve makes it suitable for processing products containing pulps and fibers. On top of all this, maintenance is very straightforward.

An ideal configuration for Flextronic fillers is **Xfill**. Here, the carbonating or mixing unit tank can be used as a buffer tank for the filler, which has no on-board product tank. A pump sends the product to a ring-shaped manifold in order to ensure that the product is fed into the filling valve correctly. This provides numerous advantages, including:

- reduction in product loss (less than 100 L during flavor change);
- the integration of the mixing and filling units produces a final product that is of higher quality and more stable, resulting in an improved filling process;
- reduction of product changeover downtime (ideally under 15 min with water rinsing);
- lower electrical power consumption, thanks to the light weight design;
- lower consumption of carbon dioxide (typically 10% less);
- lower product losses from snift circuit;
- improved performance at filler start-up.

Flextronic is also available in a version with a central tank equipped with a stirrer, for treating pulp-containing products.

A NEW LAB AND MOLD REFURBISHING CENTER FOR SIPA IN ATLANTA

SIPA is steadily building up its technical support activities for the North American market.

Back in 2012, the American branch of SIPA located in Atlanta, GA. moved into a larger and better equipped site for sales and tech support. Right from the beginning, the center was equipped with an enlarged spare parts warehouse and staffed with a skilled sales and service team, including key account managers, a technical help desk, process specialists and service engineers.

In recent months, SIPA has been ramping up its activities with mold refurbishments.

The Team has been busy building a unit cavity development center with a lab machine. The center will be capable of supporting the activities of refurbishments of any type of molds.

“The idea of building the lab as a “bottle development center” came in response to the increasingly steady demand of North American Customers to a have local support and assistance with their development and testing of new containers,” says orris De Marchi at SIPA North America. SIPA’s ‘better bottle’ development helps customers achieve their goals for market appeal and functionality while reducing risks and costs, he notes.

The mold refurbishment center is already providing an important addition to the company’s range of customer services, says Morris.

“North American customers are looking for a reliable and competent supplier for this type of service, able to provide them with a highly cost-effective way of maintaining their production quality and efficiency by preserving the life of key assets and investments.

The goal is to create trusting, long-term relationships with new and existing Customers.

Like any other SIPA refurbishment hub around the world, SIPA N.A. can refurbish hot halves and cold halves of molds made by any major mold manufacturer, not just by SIPA.

“We have already refurbished more than 15 molds covering a range of cavitations from 10 to 192 cavities,” says De Marchi.

North American customers will benefit from LCS, SIPA’s Life Cycle Service for PET bottle preform injection molds.

This is a comprehensive package of services aimed to increase the overall effectiveness of their operations, through such activities as improving the reliability and availability of equipment, analyzing productivity and parts quality, improving personnel performance, and collaborating on planning.

A NEW GENERATION OF SIPA PREFORM MOLD HOT HALVES

Hot halves have been given a thorough revision in the latest generation - the third - of SIPA injection molds for PET preforms. New technical features include the incorporation of Xflow technology to produce a considerable enhancement in flow throughout the mold, creating a better balance and reducing pressure drops. SIPA has made considerable improvements to its hot-runner technology since it introduced its first generation of three-plate layouts for the XFORM injection molding system just three years ago. With each new generation, flow has become more balanced and AA levels have fallen.

XFLOW FOR BETTER BALANCE

With the introduction of the second generation of XFORM hot runner systems, SIPA moved from a purely mechanical procedure for balancing flow (also used on PPS systems) to one incorporating Xflow technology, immediately improving flow balance by some 50%. Xflow makes use of the very latest concepts in polymer fluid dynamics to allow SIPA engineers to develop new design solutions that take greater account of melt rheology and so arrive at flow balances in the mold that are almost impossible to reach with traditional calculation systems.

FILLING VERY THIN CAVITIES

When designing Xflow hot runners, SIPA's engineers take into consideration various inherent aspects of pressure drop. "These days, we are increasingly confronted with projects where it is necessary to produce preforms that are thinner than ever," says Andrea Cavalet, Global Engineering Manager Injection Molds & Hot Runners. "So we need hot runners that consume as little energy as possible during injection, enabling the injection unit to push the melt as fast as possible into those very thin-wall cavities." Xflow is the best system currently available for making this possible. By creating a so-called "rheological balance," it minimizes the energy required for melt injection; the pressure drop along the flow path is the lowest that can currently be achieved.
"Xflow can be adapted to any application, providing excellent results in high-speed injection of critical preforms. No other system makes this possible," says Andrea Cavalet.

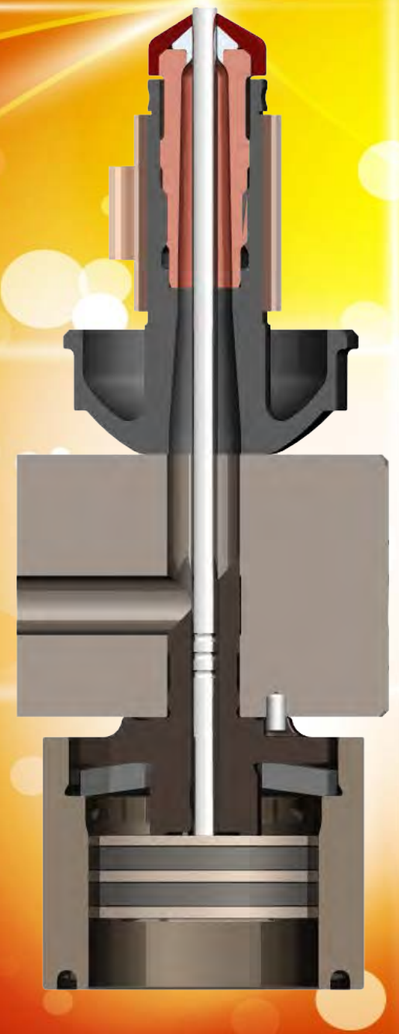
ALREADY IN ITS THIRD GENERATION

Last year, SIPA took another important step forward in mold design, with the introduction of the third generation of XFORM hot runners. These incorporate a further developed version of Xflow, which uses a totally new design of the cylinder group, valve guides and nozzles.
Third generation nozzles have an improved temperature profile and reduced pressure drop.
Ease of maintenance has been improved, since it is now easier to remove nozzle inserts in install new ones; in addition, the performance of the nozzle tip over its guaranteed five million cycle lifetime has been improved.
Various stem diameter options are available, and with the use of newly-developed ways of defining the best injection gate diameter for a particular preform thickness, gate quality is improved and cycle time reduced.

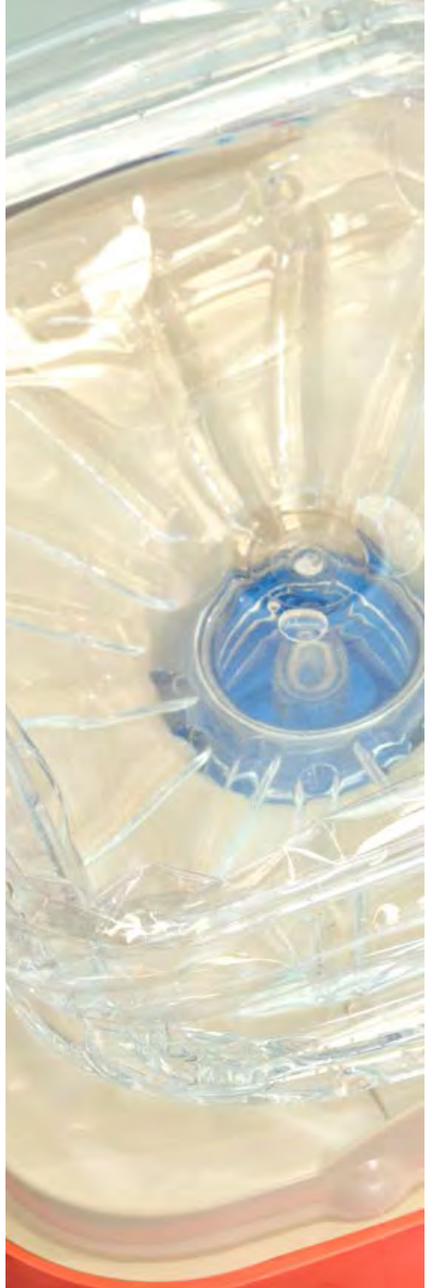
EASE OF MAINTENANCE

Maintenance intervals on SIPA molds have always been longer than on rival systems, at five million cycles (assuming standard running conditions and resin).

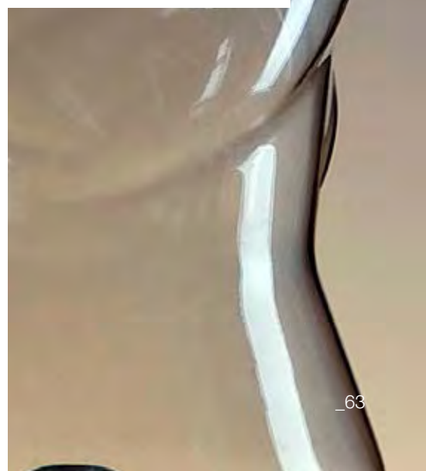
Until now, SIPA has offered a special system to remove powder created by valve movements. But a new valve drive system on SIPA molds, which makes use of a new thermal profile in the valve bushing, produces no formation of powder at all, providing a further guarantee of long life.
With the new "Generation 3" cylinder, maintenance is simpler than ever: cylinder and piston removal are easier, since no tools are needed, and removal of valve stems is more straightforward.
Sealing components last longer and there is no wear on the piston due to tilting. SIPA's third generation piston is the only one in the PET market that has two seals rings: these provide extra control over the piston alignment, virtually eliminating the tilting issue and wear on the piston.
The new hot halves are compatible with standard cold halves and equipment used in the PET preform production sector. They use the same mechanical and electrical interfaces and same hot runner thickness, providing extra flexibility in use.



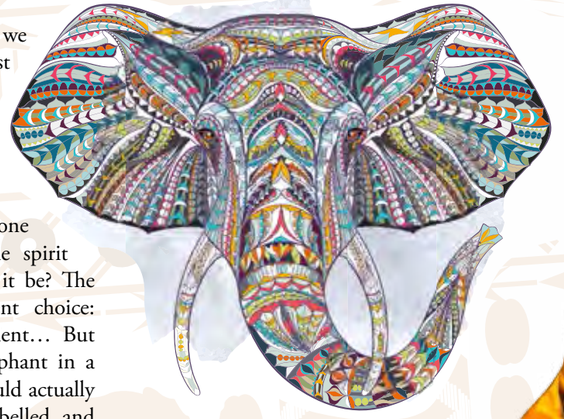
Generation 3 hot runner stack: cylinders valve bushing and nozzles.



PETWORK: CONCEPT, DESIGN, ENGINEERING. WHAT 'S NEW IN PACKAGING WORLD



PACHYDERM IN A PET PACK



"Feel free to imagine, we make it happen," boast the product designers at SIPA. "Create a bottle that summons up the spirit of Africa," somebody said.

If you had to choose one thing that captures the spirit of Africa, what would it be? The elephant is an excellent choice: massive, majestic, resilient… But how do you fit an elephant in a bottle? A bottle that could actually be produced, filled, labelled and packed on an industrial scale, and which retained all the necessary mechanical properties required to make it fit for purpose.

SIPA made it happen. Its designers have created a beautifully assymetric prototype bottle that incorporates features that conjure up the elephant as soon as you see it and touch it: parts of the surface are textured just like an elephant skin, a tusk is molded into the body, and the long neck is even reminiscent of the elephant's trunk.

On the practical side, there is still plenty of space on the bottle surface for labelling around the neck and around the lower part of the body, while the flat base provides optimal stability. Not at all elephant-like is the weight though: just 46 g for a 750-mL bottle.

The elephant bottle is a true 100% SIPA original. The company not only came up with the concept and created the design, it also optimized the preform for performance during production and in use. And then it produced the mold so that the bottle could actually be molded on standard equipment. Nor will this bottle present any problem being filled, labelled and packaged on an industrial scale. Nothing was forgotten - an elephant would appreciate that!

We think this is an idea that can fly. Just like the world's most famous elephant.

THE INCREDIBLE SHRINKING DISPENSER BOTTLE

Large PET dispenser bottles are an excellent means of storing and dispensing water in the office and in the home. For one thing, they are much lighter than traditional glass versions, which weigh close to 20 kg in their five-gallon versions. A regular multi-trip PET dispenser bottle - sometime also called a water cooler bottle, when it sits on a dispensing unit that has a refrigeration system incorporated into it - weighs around 650 g by contrast.

A recent trend has been to use single-use PET dispenser bottles, which weigh even less, at a minimum weight of 330 g.

This saves on materials of course, as well as on transport costs. But the bottles still take up a lot of space. The best type of single-use bottle is one that collapses on itself as the water is consumed, ending up as a fat disc that takes up much less room than the original.

FEM ANALYSIS

But that is easier said than done. Bottles often collapse in an irregular manner, leaving lots of

PETWORK - COLLAPSIBLE CONTAINERS

space inside even when they are completely empty of water. So SIPA has been putting a lot of effort, together with various customers, into developing designs for large PET dispenser bottles that are fit for purpose in transport and use, and which collapse on themselves as neatly as possible as they empty.

Collapsing sequences were simulated on computer using Finite Element Method (FEM) analysis to find the buckling mechanism that would best suit the client's requirement. "FEM analysis accelerates the time of investigation and reduces the number of trials aiming at the correct solution," says Dino Zanette at SIPA. "It also aids in determining a minimum weight at which the collapsing mechanism is still functional.

"SQUARE AND ROUND" DESIGNS

Different bottle shapes, square and round, were analyzed along with the shape of the ribs and base. Graphs of volume vs. pressure and base center displacement vs. pressure, together with photograms of the simulation, helped the SIPA experts to better understand the collapsing phenomena and how to modify the bottle structure to get the best performance. Physical prototypes were built to verify the "virtual" results.

Trials have proven the reproducibility of the collapsing mechanism that was studied during the development stages. So now, fully self-collapsible containers that require the application of no external mechanical forces to deflate are in industrial production. This makes the job of collecting them for recycling or simply putting them in a recycling bin much easier than before.

Last year, SIPA MAGAZINE covered the story of two Japanese companies specializing in home and office delivery of large water bottles - Cosmo Water and Water Direct - who had begun producing self-collapsing 12-L dispenser bottles. In the meantime, more SIPA customers have begun taking advantage of this innovative development.

SIPA TEST LAB IS SUPER-SPECIFIED

PET preform and container production specialist SIPA has comprehensive laboratory facilities that enable it to carry out a comprehensive range of tests, not only on all shapes and sizes of preforms and containers (including jars, handled containers and beer kegs), but also on caps, closures and separate handles, plus all the materials they are made from.
Tests on preforms and containers include numerous measurements for dimensional accuracy, mechanical, physical and chemical tests, several functional tests of which hot-fill distortion, stress cracking resistance, drop and leakage tests, as well as a host of other more exotic.
As far as materials characterization is concerned, SIPA Lab has competence not only in PET, but also polyolefins (PP, HDPE), polystyrene, and such biopolymers as PLA and PHA.
For CSD application, the Lab is equipped with a small filling line to pressurize the bottles and replicate industrial process.

VERSATILE TESTS

One particularly versatile tool that SIPA Lab has at its disposal is FT-IR spectrometer.
This can be used to determine the loss of CO_2 from bottles, and in addition it can characterize a material by determining the functional groups it contains, aiding to identify possible additives and analyzing chemical compatibility.
The FT-IR equipment can be used in an ATR (Attenuated Total Reflection) configuration, which enables samples to be examined directly without any special preparation to determine the characteristics of the surface layer of a product with near-infrared radiation.
Tests for non-standard containers
SIPA Lab is equipped with instruments, some developed internally, for the characterization of non standard containers (such as large kegs for CSD and beer, as well as large containers for dispenser)
Among other properties, Handle resistance, top load and burst strength can be carried out.

OUT-OF-THE ORDINARY TESTS

Among several dedicated tests that SIPA Lab carries out is the measurement of acetaldehyde levels with gas chromatography (using the ground parison method), and

the measurement of moisture levels in granules, preform or container using a Karl Fischer titrator.
The laboratory is even equipped with a UV-visible spectrophotometer. Another facility worth noting in the SIPA lab is a small pasteurizer with which technicians can simulate sterilization and pasteurization cycles. The use of datalogger helps to monitor the temperature and pressure of the content during the process. An unique instrument that has been built internally used principally for light-weighting research projects permits to determine the falling angle of a bottle and to observe the behaviour of the bottle during pouring.

CO_2 LOSS, O_2 GAIN

Among the tests that the company regularly carries out in conformance the normal protocols of the major players in the market, there are some rather particular ones that can be used to determine product shelf life. “We are able to determine the loss of carbon dioxide and, in the case of products susceptible to oxidation, oxygen uptake, using various techniques, depending on the protocols of various clients,” says Roberto De Luca at SIPA, who notes that the company is a certified laboratory for major players.
Characterizing barrier performance
SIPA Lab is able to characterize existing containers and develop new barrier packaging using oxygen scavengers, PET/PA coinjection, or special coatings.
It uses a variety of tools to determine the mechanical and physical characteristics of coatings, including various devices to test for hardness, adhesion, abrasion resistance, and so on.

SIPA SMELLS THE AROMA OF SUCCESS IN PET COFFEE JARS

Some experts at SIPA, possibly fresh after their coffee break, have decided that PET really should be used more for packaging coffee. PET provides a much better packaging solution for the various types of coffee currently available on the shop shelves - whole or pre-ground beans, as well as soluble coffee powder and granules. PET jars are fit for purpose as the packaging these products normally come in.
Coffee needs a lot of protection, and each kind of coffee calls for packaging with a specific set of properties, in terms of protection and also aesthetics. Beans need protection from the light, oxygen ingress, CO2 release; soluble coffee needs extra protection from humidity. That is why today, so many different types of packaging are used for different types of coffee: metal cans, glass jars, multilayer bags and pouches, etc.

It is possible to meet all these various demands with PET jars. The inherent excellent packaging

properties of PET can be further enhanced by including oxygen scavengers, passive barrier, light-blocking colorants, and so on.
The advantages for PET jars are numerous: they are light, virtually unbreakable, re-sealable, they can be made with wide necks for easy pouring and spooning, and the design possibilities are considerable. Some possible examples created by SIPA's design team are shown here.
By the way: did you know that the coffee bean is not a bean at all? It's a seed, of the coffee berry. And did you know that the genus of plant from which coffee seeds come is called coffea? And that caffeine is produced by the plant to protect the seeds against herbivores?

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04-06 NOV.

CBST

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10-12 NOV.

BRAU BEVIALE 2015

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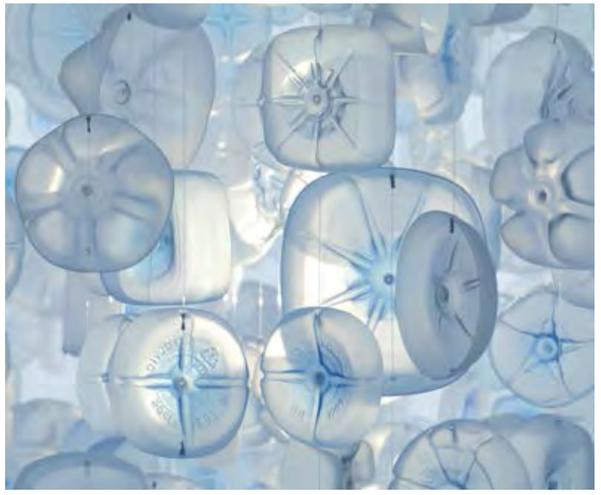

Front cover: Drop chandelier by Stuart Haygarth
Photography: Stuart Haygarth - www.stuarthaygarth.com

Elevating the commonplace or discarded object is a central tenant of Haygarth's work. His exquisite designs and installations have employed the flotsam and jetsam of everyday life - from man made debris washed up on the seashore to thousands of salvaged prescription spectacles. Creating order and symmetry out of randomness and waste, his work is as much about the process of collecting and collating materials as the elevation of these materials to objects of value or beauty. By constructing narratives about time, loss, abandonment, and modernity, these human aspects attached to the chosen objects are an integral part and driving force within the work. As he has said, 'My work revolves around everyday objects, often collected in large quantities, categorized and presented in such a way that they are given new meaning. It is about banal and overlooked objects gaining new significance'.

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