

# SIPA SPEAKS



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**SIPA**



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## SUSTAINABILITY

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# Sustainability in the time of Covid



Welcome to the latest edition of SIPA SPEAKS. In this issue, we look at some hot issues, and how SIPA is addressing them. But first, a few words about the hottest issue of all, COVID-19. All of our lives have been turned upside-down by the pandemic. The expression “new normal” has been used before, but it is clear this time that the paradigm really has shifted: the world has changed.

On a business level, since the beginning of the year, many concerns have closed, and some of them will not re-open. Through strength of purpose and a commitment to its customers around the world, SIPA has continued to operate, but not always in the same way as before.

SIPA has become ‘smarter’ than ever. It has developed new ways to implement installations and provide technical service for example - ways that in all probability will continue to be of use even after the pandemic has passed.

Since the very beginning of this crisis, SIPA has been collaborating with its various sources of supply to ensure the provision of necessary parts and technical upgrades to its customers.

Using its partnerships with major logistics companies, SIPA has done everything it can to minimize the effects resulting from the intensification of controls at customs and delays in logistics. And it has developed a smart, remote approach to follow the installation of machines and systems.

This is possible because our experts have developed special procedures that cover all installation steps, from the unloading of the machine parts through to the assembly and connection of all the functional groups. We are making maximum use of advanced fixed and mobile software applications and IT tools to ensure success in execution. Never far away is our motto. Even in this difficult time, SIPA intends to provide the best possible service and support for all our customers and business partners, wherever they are.

On a separate level, SIPA has also been looking at how its technology can help consumers get through the day more safely. One of the effects of the pandemic has been increased emphasis on having clean hands. Many people have turned to the use of sanitizing liquids in small bottles where regular soap and water is inconvenient. SIPA’s smaller ECS SP single-stage injection-stretch-blow molding machines are proving ideal for production of these containers.

Pressure to reduce, recycle and reuse plastics packaging continues to rise. Litter is a blight on society and we have to find more ways to prevent it. Single-use PET bottles are in activists’ cross-hairs, but in Europe at least, recovery rates are not so bad. In 2018, for example, according to a report commissioned by several industry

groups, 1.78 million tonnes of post-consumer PET bottles were collected and sorted for recycling. There is a long way to go, but it is progress.

SIPA has for many years been active in the “reduce” element of course, developing technologies for lightweighting, and it has also been putting increased emphasis on use of recycled PET (rPET) in containers made on its equipment. In this issue, we look at the best ways to make high-quality containers with rPET, whether it is by using ground-breaking injection-compression molding technology integrated with recycling equipment (Xtreme Renew), or more conventional systems with special features designed specifically for processing rPET.

Sustainability also calls for energy efficiency. Systems integration can play an important role here, which is one reason why it is the subject of our FOCUS ON feature. Integration reduces the need for heating and cooling, and it also cuts the bills by raising productivity and reducing space requirements - all while allowing highly customized packaging solutions. You can find out how SIPA is able to integrate everything from pellet to pallets loaded with filled, capped and labelled containers; you may even be interested in a highly innovative system that SIPA developed for ISBM production of bottles, not in PET but in polystyrene - possibly a world-first; and on the reuse element of sustainability, see how one customer has integrated production of multiple-use PET bottles.

We wish you a good read!

**AROUND  
THE GLOBE:**  
news from the  
different continents.

# 01



GREECE

**THE BEST WATER IN  
THE WORLD IS NOW  
ALSO BEING BOTTLED  
ON A SIPA LINE:**

**FROM CRETAN  
MOUNTAINS  
TO SIPA BOTTLE.**





On the Greek island of Crete, not far from the beautiful village of Zaros (population: 2150), a much-appreciated mineral water bubbles up from a spring called Amati in the Psiloritis mountain. 30 years ago, the people of the village banded together to create a cooperative company, also called Zaros, to bottle this wonderful water and export it all around the world.

Three years ago, this water, branded Zaros, was named “Best Bottled Water in the World, at the 27th Annual Berkeley Springs International Water Tasting, beating off competition from more than 600 bottled waters from all over the world. That was just a year after Zaros earned the top European Best Taste Award, awarded by the International Taste Institute in Brussels. In this competition, the Cretan water was evaluated by 30 judges, all members of prestigious catering companies in Europe. This recognition has pumped up demand for Zaro’s bottled mineral water, leading the company to seek out a supplier of equipment for a new bottling line. Last year, Zaros chose SIPA for design and supply the line, to blow and fill bottles for still & sparkling water and also a new line of flavoured waters.

Zaros now has an all-new SIPA line based on a Sincro Bloc 6-40-8, composed of an SFR6 bottle blower and a Flextronic C 40-8 volumetric filler, followed by a rotary capping turret, and a Massblend 27 mixing and carbonation unit. The line produces bottles in various sizes: 330mL, 500mL, 1.0L and 1.5L, at output rates of up to 13,500 bottles per hour.

Zaros came to SIPA because it wanted a partner it could rely on, with a reputation for quality, and which could offer performance at a competitive price. Zaros was finally convinced that SIPA is a company at the top of its game, offering leading technology and reliable after-sales service. SIPA’s currently discussing the possibility of supply of downstream equipment, from the labelling unit onwards. In the meantime, ZAROS water in SIPA bottle will ‘travel’ with AEGEAN Airline flights, the Greek flag carrier, after a relevant agreement signed between the two companies.

SIPA team wishes all the best to ZAROS water.





U S A

# SOYBEAN SPECIALIST INCOBRASA HAS A CRUSH ON SIPA FOR OIL BOTTLE BLOWING AND FILLING



Renato Ribeiro knows a thing or two about soybeans. In fact, the Brazilian has more than 60 years of experience in extracting oil from them. In 2004, Incobrasa, opened its first packaging operation in Gilman, Illinois, USA.

Now, with its latest investment, it has chosen SIPA for an integrated bottle blowing and filling line for the edible vegetable oil.

Incobrasa chose SIPA's latest generation of rotary stretch-blow molding equipment, the Xtra, in a Sincro combination with a Flextronic W, SIPA's high-precision electronic weight filler with an extremely simple, hygienic and fast "no contact" valve.

The system makes and fills bottles in two sizes, 16oz and 48oz, at a rate of up to 15,300 bottles per hour for the 16 oz, 2550 bottles from each of the six cavities on the Xtra, 8,400 b.p.h for the 48 oz.

Such speed is possible thanks in large part to an active process angle of 200 degrees - some 15% wider than the industry average - which allows for stress-free blowing at high speed.



The Sincro Bloc system features very fast product changeover without the need for special tools. The line is equipped with an ECHO system for remote control and monitoring, enabling digital management.

These are not the only reasons why Incobrasa chose Xtra and Flextronic W from SIPA though. "We have been very satisfied with the cooperation and onsite service that SIPA has provided, as well as its problem-solving capacity," says Mariano Moliner, Incobrasa's Bottling Plant Manager.

Incobrasa is a leader in the production of high-quality oilseed food products and also biodiesel fuel. Founded in Brazil as a processor (crushing and oil extraction) of soybeans, it has held interests in US farmland and soybean industry since 1982. Its first North American soybean processing plant, in Gilman, became operational in 1997. The site has since grown to include an oil refinery, a packaging facility for food-grade vegetable oil and a state-of-the-art biodiesel production plant.

Result: the ideal mix of high quality and quantity. The Xtra also stands out with its cost-efficiency: energy consumption is so low that production of each bottle requires 25% less energy than on previous generations of rotary machines.





ZAMBIA

# SIPA GIVES BIG TREE BEVERAGES THE SPEED AND FLEXIBILITY IT NEEDS TO BOTTLE FRUITICANA JUICE DRINKS



with  
Real  
Cells



“

New Fruticana fruit juice drinks from Big Tree Beverages are free of preservatives, thanks to SIPA. A new fully integrated blowing and hot-filling line was commissioned by SIPA at Big Tree Beverages' main plant in Lusaka, Zambia, at the end of last year, and the drinks have been booming into market since then.

”





Big Tree Beverages also took advantage of SIPA's skills in bottle design to create new shapes with wrap-around labels for the Fruticana juice bottles. These come in several sizes and very innovative flavors. All the hot fill bottles have a 1881 neck finish that works with standard 1881 closures. The new line starts with a rotary stretch-blow molding unit equipped with 12 cavities, which feeds bottles directly to a Flextronic SE 36/9 filling monobloc. This is an electronic volumetric gravity filler, designed for hot-fill applications in ultraclean configurations. It is capable of running Nitro Hot Fill, in which a small amount of nitrogen gas is injected into the top of the filled bottle to stop it from deforming as the contents cool (the Flextronic can also be used for standard hot fill and cold fill). That's followed by a cooling tunnel, labeler, and finally a shrink wrapper.

The flexibility of the line was an important factor in Big Tree Beverages' choice of SIPA for its latest investment. It means that changing from one product to another is quick and easy. Molds can be changed quickly, so it is easy to move from one bottle size to another (and in the future, possibly change bottle designs while processing the same size of preform). On top of that, SIPA has provided a system that gives the output Big Tree Beverages needed - the line runs at very high speed - for the money it wanted to spend. Plus, there was SIPA's ability to create a new bottle design in line with the customer's concept for the Fruticana brand. SIPA's Sales Manager for Southern Africa highlights further advantages of the system. "Consumption of air and energy is low, and Nitro Hot Fill helps further in containing costs compared to standard hot fill," he says.

"Finally, the whole line fits into a relatively small space." Big Tree Beverages is one of the largest beverage companies in Sub-Saharan Africa, offering a broad portfolio of beverages at a very affordable price point in over 10 countries. The product range includes energy drinks, cola, various carbonated beverages, juices, cordials, and many other type of beverages. The portfolio is constantly changing thanks to the visionary approach of the family that leads the company, in line with the company's goal to keep offering products that fulfill changing consumer demands and provide with best in class refreshments. Big Tree Beverages, which employs more than 5000 people in Zambia and adjoining countries, is a part of Trade Kings Group, the largest FMCG company in Sub-Saharan Africa.



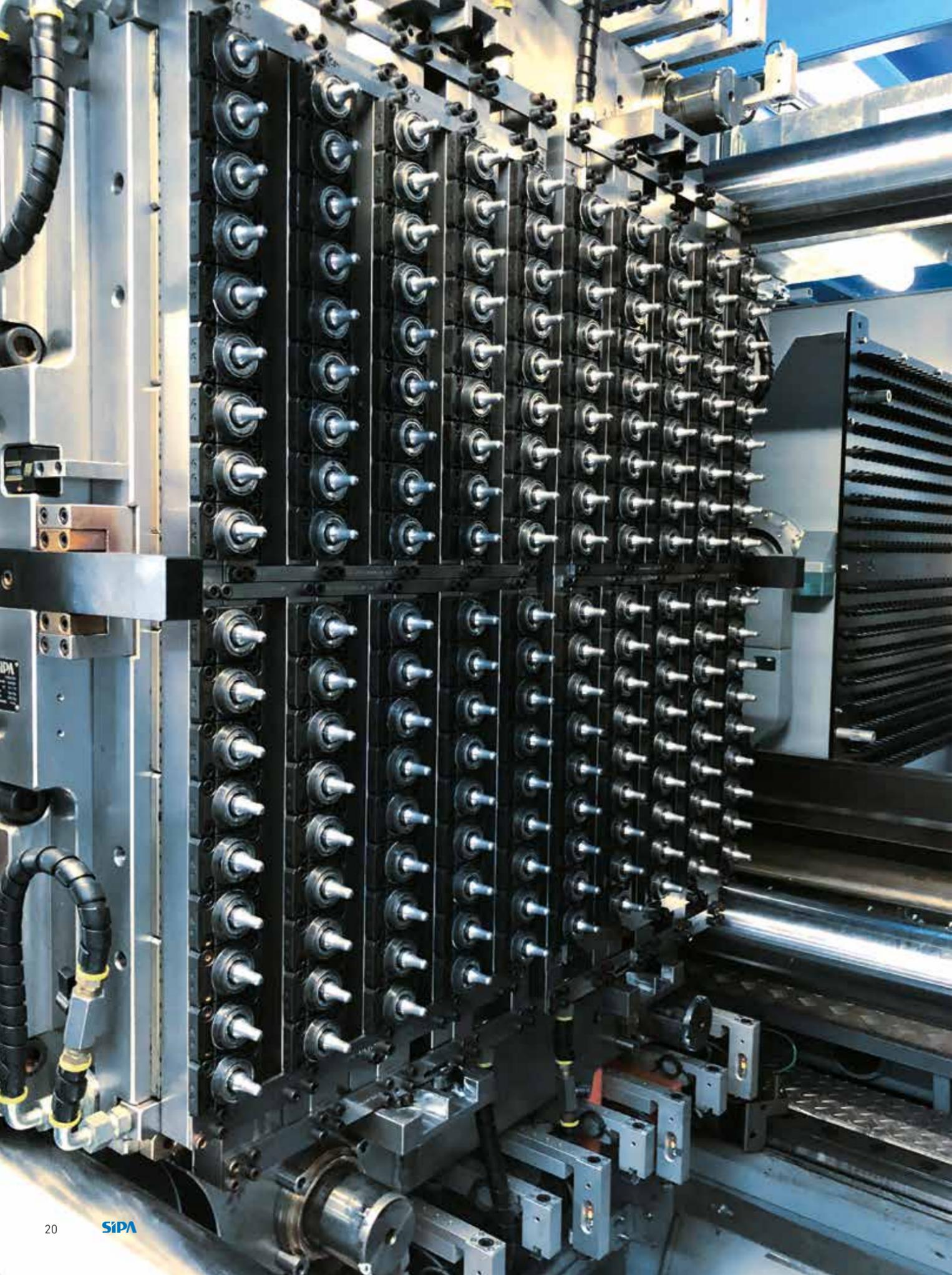
# Parlé Agro

INDIA

# PARLE AGRO MAXIMIZES OUTPUT QUANTITY AND QUALITY WITH SIPA XFORM

India's largest beverage company has put its faith in SIPA for high-volume production of PET preforms for fruit drink bottles. Parle Agro has five SIPA XFORM injection molding systems hard at work producing 5.7 million PET preforms every day to make bottles for fruit drinks. There are two 500-tonne systems and three 350-tonners. Between them, they make preforms for 160mL, 250mL and 300mL bottles for Parle Agro's famous Appy Fizz sparkling apple drink and Frooti mango drink. The preforms range in weight from 8.5 to 13.5g. The company, headquartered in Mumbai, has many reasons for opting for the SIPA machines. First off, it says the XFORM units provide the flexibility it needs when introducing new designs and concepts; for example, not long ago, Parle Agro developed a customized bottle neck for the Appy Fizz 160-mL bottle. The Company takes pride in being one of few companies manufacturing PET preforms derived from the bottle design with the best stretch ratio specifications. Parle Agro's latest development with the best bottle stretch ratios has been for Appy Fizz 160mL bottle, at the best-optimized grammage of 9.6g.





Then there is the issue of output: XFORM injection molding machines can take molds with more cavities than most other competitors, and they also have the shortest dry cycle times. Parle Agro is one of the first companies in the Asia Pacific Region to install a machine - an XFORM 500 - running with a 180-cavity mold - from SIPA, obviously. SIPA has also supplied two 128-cavity molds. The XFORM units are equally capable of operating with molds from other suppliers.

“But it’s not just about quantity. Preform product quality is high and consistent”, says Jitendra Kulkarni, Senior Manager Technical at Parle Agro. “All this, while using less energy than competitors.”  
Adds Mr.Kulkarni.

Parle Agro claims to be the only beverage company in India making its own PET preforms. What started as a relatively modest consumption of 2,100 tonnes per year back in 1996 has since risen to well over 53,000 tonnes. The company takes great care to ensure the standard of quality delivered including timely supply and uniformity in the weight of preforms. Parle Agro has three manufacturing hubs, producing preforms both for internal and external conversion.





TURKEY

**SIPA**  
**KEEPS**  
**DRINKS**  
**MAKER**  
**DOĞANAY**  
**GIDA IN**  
**GOOD**  
**HEALTH**



A next-generation XTRA10 rotary stretch-blow molding system is the latest addition to a growing group of SIPA machines at Doğanay Gıda, an innovative producer of health drinks in Adana, Turkey.

Doğanay Gıda first came to SIPA in 2007 for an SFL6/6. Two years later, it took an SFR12 EVO2, and then in 2011, SIPA installed a third system, an SFR8 EVO2. The XTRA10 was added soon after it was launched, in 2018. All told, Doğanay Gıda is now producing and filling close to 60,000 bottles every hour, in sizes ranging from 250mL up to 5 liters.

The Turkish company first made a name for itself with its fermented black carrot juice, called simply Doğanay. In the meantime, it has added several more flavors and brand names. A non-carbonated lemonade, free of additives and colorants, as well as strawberry and pineapple drinks, go by the name Lita. The company now also offers a range of condiments and sauces under the Nare banner: grape vinegar, balsamic vinegar, white vinegar, lemon sauce, pure lemon juice, 100% pomegranate syrup, pomegranate sauce, and a garlic hot sauce.



The Bütün brand is used for pomegranate sauce, grape vinegar, apple vinegar, and lemon sauce. Gökhan Gök is General Manager at Doğanay Gıda. Why did his company choose SIPA? “When we were making the choice for our first bottle blowing system, we could see that SIPA was already really well-known with a proven reputation in the market and experienced in blowing machines with systems installed around the world,” he says. “But we chose SIPA not only for the quality of its machines: its service and quick response with well-trained technical personnel for any customer problems is the other main reason why we always pick SIPA machines in our filling-line investments.”



The SIPA bottle blowing systems are also helping Doğanay Gıda with its energy bills, thanks to their low consumption of electricity and overall high efficiency. Their compatibility with downstream equipment, whether it be from SIPA or other suppliers, is an additional advantage. Doğanay Gıda was founded as a foods company by Father Hasan Doğanay in 1960, moving into fermented black carrot juice production in 1997. The product turned Doğanay into one of the few recognized brands from Turkey around the world, with its unique taste and quality. Besides dominating the fermented black carrot juice market in Turkey (it has a 95% share), the company also exports 35% of its total production to more than 30 countries all over the world.



PERU

# SIPA FULFILLS EXPECTATIONS AT ARCA CONTINENTAL LINDLEY

## Arca Continental Lindley S.A. in Peru is one of the latest major bottling companies to opt for SIPA equipment to produce and fill PET containers for soft drinks.

The company, also known as the Lindley Corporation, has been in business for well over a century, manufacturing, distributing, and marketing non-alcoholic beverages. With seven plants around the country, and headquarters in Lima, it is the official bottler and distributor of all Coca-Cola products in Peru.

Five years ago, Lindley integrated its operations with Arca Continental, one of the most important Coca-Cola bottlers in the world.

Lindley is using the line for Frugos nectar and Powerade sports drink products, in various formats from 300mL up to 1L. The principal elements of the line are an SFR24 EVO stretch-blow molding unit, a Flextronic SE 108 volumetric gravity filler, and a Genius-PTF Fastlayer palletizer.

The Flextronic SE filler is particularly flexible, with its ability to handle a wide range of non-carbonated drinks, including hot-fill liquids.



It is best known for its creation and marketing of Inca Kola, the top-selling soft drink in Peru. Today, Lindley produces soft drinks, water, juices, isotonic and energizers. Employing more than 4,600 collaborators, it serves more than 340,000 thirsty customers in Peru.

A few months ago, SIPA installed a major new bottle blowing and filling line for juices and tonics at Lindley's plant in Zarate, an area of Peru's capital city Lima.

Output for smaller bottle sizes is 40,000 bottles per hour, while capability for 1-L bottles is 28,000/h.

Daniel Schweyer, SIPA's Key Account Manager for Coca Cola, says that with the new line, Arca Continental Lindley has gained the important advantage of being able to standardize its hot filling lines in the South America region.





**We think Arca Continental Lindley also appreciated our willingness to solve any problems that may have occurred during startup.**

The Flextronic SE filling monobloc, equipped with “no contact”, double speed shutter filling valves made in AISI 316L low-carbon stainless steel, is designed for hot-fill applications in ultra-clean configurations.

This makes it suitable for hot and cold filling of sensitive products such as premium fruit juices containing non-homogenized pulp.

Gaskets and plastic components in contact with the product are realized with food-grade material and in accordance with the sanitization and sterilization processes. Hot-fill applications work with in-valve recirculation.

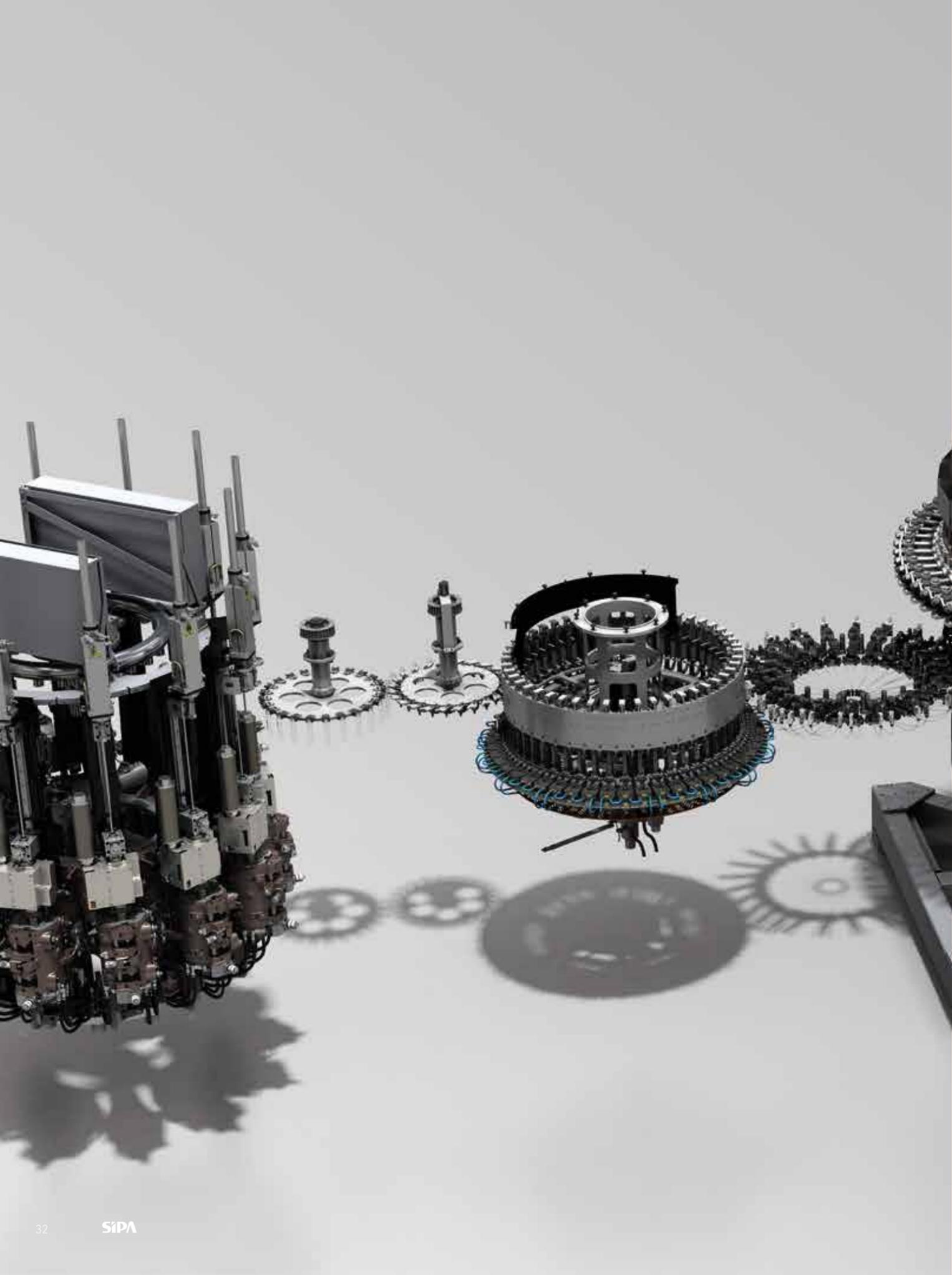
Each valve is provided with a magnetic flow meter and a pneumatic shutter valve: the movement of the command stem is protected by a membrane in compliance with the highest hygiene standards.

An optional second membrane valve, mounted in series, regulates the double filling speed to optimize the filling cycle.

**We had already installed two SIPA hot-filling lines for the group in the region, one in Quito in Ecuador and another in Salta in Argentina.**

**The customer was very satisfied with both of those lines, so it made a lot of sense for them to extend its partnership with us.**





**FOCUS ON:**  
systems integration

02



SIPA has demonstrated its consummate skills in integrating diverse technologies into a single system on many occasions. Today, there are numerous production lines in operation that begin with a SIPA PET preform injection molding machine and end with SIPA palletizing and stretch-wrapping equipment. In between, you may find units from SIPA for blowing the preforms into bottles, for filling those bottles, for capping those filled bottles, and for labelling those formed, filled, and sealed bottles. Everything works together - works well together. Just about every line is different, so SIPA designers, engineers and technicians are constantly on their toes. And, of course, once each line is successfully installed and running, there comes the challenge for them to do something else different, something else better. The state of the art in systems integration (better to think of it as the state of the technology) is

always in a state of flux. Individual pieces of equipment continue to improve and change, and at the same time, the demands customers are in constant evolution. For example, SIPA XFORM preform injection molding machines have progressed through four generations in fewer than eight years. In that time, market demands for higher performance, lower weight, greater sustainability in packaging have increased inexorably. How is SIPA continuing to rise to the challenge? Let's look at one recent in-house development, together with coverage of two new projects for customers who want to push the boundaries of what is possible in rigid packaging. We can't give you the names of the customers, and we can't go into a lot of detail, because the projects are commercially sensitive. But we hope to provide an idea of where SIPA is heading in technology development and systems integration.

# MASTERING COMPLEX SYSTEMS INTEGRATION

# Integrated Preform Production / Rotary Blowing / Filling

First, a prime example of system integration. The XTREME Sincro Cube system is the ultimate in process integration, combining ultra-lightweight preform production, extremely energy-efficient bottle blowing, and filling and capping. It can be configured for all kinds of products: still and carbonated, cold-fill and hot-fill, with and without pulp, sensitive products (including CSDs without preservatives) and value products such as edible oil, milk and derivatives, premium clear juices, home, and personal care products. The solution is compact - everything fits into a space of about 200 square meters - and cost-saving. And it produces a better result. The XTREME injection-compression molding system creates preforms that are up to 10% lighter than even the lightest preform produced by conventional injection molding. XTREME feeds XTRA, SIPA'S latest rotary blower platform designed to achieve top performance levels with the highest energy saving at the highest speed in the market. Finally, there is Flextronic, an innovative modular range of electronic, volumetric filling monoblocs. By choosing the most suitable filling valve, it is possible to create bespoke solutions for a wide range of bottling needs.



## Multiple-use bottles

The first customer project to highlight shows how SIPA technology can push boundaries in the Circular Economy. The customer came to SIPA for a system to produce bottles that could be used many times over for filling with carbonated drinks. The system SIPA developed starts with an XFORM 350/48 Gen4. It can produce several different types of preform: for 0.5-liter bottles, preforms in PET, but there is also a version in a high-performance copolyester, which weighs just 60g (this copolyester has a glass transition temperature of around 95°C - close to 30°C higher than PET - which means that bottles made in the material can be put in a dishwasher). The customer also wanted to produce 1 liter bottles, so the XFORM can mold PET preforms for such bottles too in PET or weighting a bit less in copolyester. So that's four molds, all made by SIPA as well. The preforms are automatically taken out of the mold by a "cool pick plate" on a robot arm and transferred to a stabilization station, where they remain for several cycles. Once stabilized, they are picked up by a six-axis anthropomorphic robot, which has special end-of-arm tooling equipped with vacuum suction, and transferred to a SIPA SFL 6/6 EVO stretch-blow molding machine. Here, the bottles are formed (the necks are also oriented) and then transferred using star wheels for 100% in-line scanning with a camera to ensure their quality. All of this happens in an uninterrupted process, running at a rate of 3000 bottles/h.





# More ideas?

So there you have it: three totally different, totally ground-breaking integrated production systems - systems that will help users save money in a sustainable way. SIPA wants to continue in this highly innovative spirit. So, if you have a crazy idea that might just work, we could be interested.

## Blowing polystyrene

The second customer had an even more unusual request. They wanted to produce special containers - not in PET, not even in copolyester, but in polystyrene. The customer wanted to make them using injection-stretch-blow molding. Why ISBM? These containers are not, as you might have been thinking at the beginning, like petri dishes, flat and wide, but rather narrow and quite tall. The largest in fact is 500mm tall. Virtually nobody uses polystyrene for ISBM. The literature is almost void of any discussion of the process. It is not rare (not common either, though) for polystyrene to be used to make biaxially oriented film, but bottles? That is what the customer wanted, and SIPA was up for it. The main challenge for SIPA was in finding optimum stretch ratios, and defining optimum process conditions - melt temperature, preform demoulding temperature, conditioning process... everything. Not surprisingly, the prototyping phase was extensive. In the end, a line was created based around a specially-developed single-stage ISBM system, an ECS SP80 H. The H signifies that the machine is much higher than a standard ECS SP80 configuration. But the main difference is in the mold opening capability, which is much wider on the special version, to accommodate the very long preforms: these range up to 425mm, whereas a standard unit can make preforms up to 175mm long. In addition, the ECS SP80 H can run with taller blow molds (the ECS SP80 can blow containers up to 340mm in height). A special screw diameter (70mm diameter) was also created in order to provide a large enough shot size (600g, for production of four 150-g preforms at a time). Once the bottles are blown, a multi-axis robot carries them to a plasma chamber for sterilization, and then to a line conveyor. This takes them through capping and labelling stations, and then onto a bagging machine. Once bagged, automation finally yields to manpower, as the bags are placed in a carton box by an operator at the end of the line.





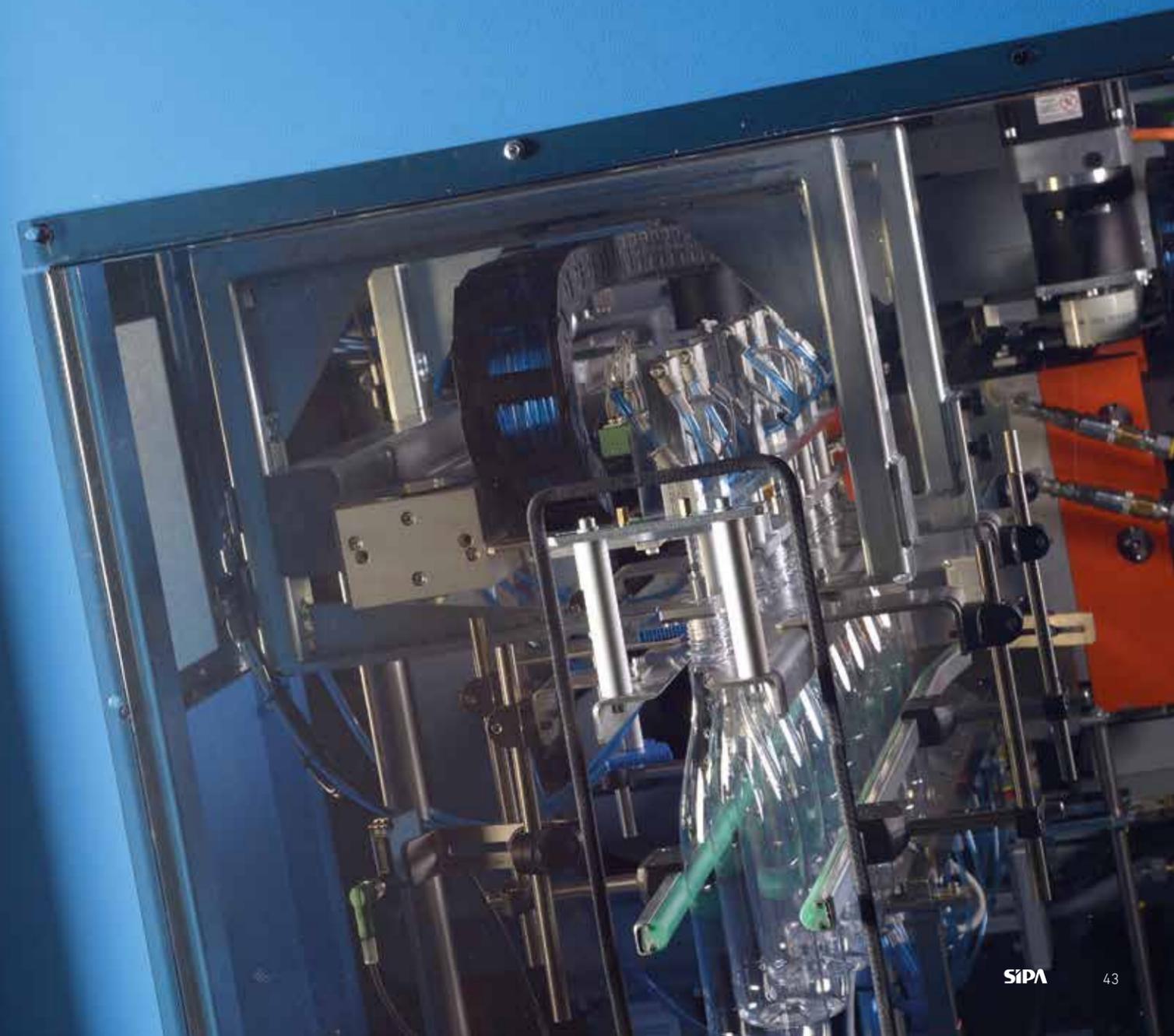
**TECHNICAL  
WINDOW:**  
latest developments.

03

# LINEAR STRETCH-BLOW MOLDING IS UPGRADED

The next generation of SFL EVO linear stretch-blow molding systems is nearing completion. SIPA has been working its magic once again to introduce numerous upgrades in terms of speed, quality, versatility, capability, energy efficiency, and overall sustainability. All the new developments, together with the low cost of maintenance, result in the lowest total cost of ownership, TCO, on the market.

# SFL EVO





## GROWING FAMILY

SIPA is introducing the new generation of SFL EVO machines step-by-step. It began in 2017, when the SFL 6/8 EVO was unveiled. The full range of SFL EVO 6 types is available, with the number of cavities ranging from three to eight, according to size. Oversize blowing press dimensions, XL and XXL, cater for taller and larger bottles respectively. The SFL EVO 4 is now available in versions with up to five-cavities, as well as SFL EVO 4 XL versions with various levels of cavitation. The pitch of the ovens also comes in two sizes, for bottles with different neck diameters, opening up the possibility of more precisely tuning energy heat output to neck/bottle type.

## BEST IN CLASS

Improvements introduced into the new machines will ensure that the SFL EVO family retains its “Best in Class” position among linear systems. Output has been validated at up to an genuine 2000 bottles per hour per cavity, which is 10% higher than the previous generation and beyond the reach of any other system on the market today. That means an eight-cavity unit can produce 16,000 bottles every hour, in sizes in the range from single-serve up to 1000mL. Higher output is due to such factors as faster press movements and improved blowing valves. Despite this significant increase in capacity, energy consumption is lower than on the last generation of machines. Production of the common multi-serve 5L size is faster than before too: up to 7,500 bph can be blown in a unit measuring barely 36m<sup>2</sup>: that’s an outstanding solution for customers looking to about 40,000 liters per hour!

## MAXIMUM VERSATILITY

The range of container types that SFL EVO units can produce is close to limitless: round, oval, oriented neck, long neck, wide mouth, hot-fill, handled (in-mold or post-mold), refillable containers with thick walls, as well as collapsible containers with very thin walls, and many more. It is possible to produce small bottles and big ones, all the way up to five-gallon water cooler bottles and even beer kegs.

## PRECISE CONTROL

Machines are fully electric, which means (among other things) that they are very clean and very precise. Installation and start-up times are very short. Controls are very comprehensive but easy to use at the same time, thanks to new HMI software and a large touchscreen.

## ECHO

SFL EVO is designed to exploit ECHO, SIPA’s new customer lounge providing full on-line remote support, immediate collection of operational data (making it easy to monitor performance, even on mobile devices), digital manuals and spare parts navigation, tracking of service requests, interactions, and shipments.

Smart movements

Important new features include a smart clamping unit with “dynamic stroke.” Servo drives make it possible for the user to choose from three different strokes, so they can optimize output. New SFL EVO machines (with a few exceptions) accept all existing SFL molds.

## LESS AIR

Blowing blocks and the air circuit have also been further optimized. So, for example, dead air volume has been reduced by around 30%, with ARS PLUS valves integrated into the blowing blocks. The service air circuit has been optimized, as well as all piping and connections, simplifying daily use, maintenance and troubleshooting.

## SIMPLE MOLD CHANGES

There is also a new mold changeover procedure. Molds can now be removed in a single block, eliminating the need to remove the base assembly before the cavity backplates.

## QUALITY MEASURES

Quality control measures are of the highest order on the next-generation SFL EVO. Camera systems can be integrated to check incoming preforms and outgoing containers, in order to obtain closed-loop control, and reduce container variability. There is also a new development to assure lack of leaks: immediately after blowing, an additional station checks for container integrity. This is a mandatory quality-gate for high-value products, since it eliminates the need to perform additional checks on a separate machine before filling.

## SINCRO CONNECTION

The new SFL EVO machines also exhibit evolutionary improvements elsewhere. A new preform transfer system, for example, handles the preform necks more gently; and the “SINCRO” connection to enable integrated bottle blowing and filling has also been improved, with a compact and clean system to release blown bottles to a rotary filler star-wheel now possible.

## CO<sub>2</sub> REDUCTION

To meet the daily challenge of plastic container production, it’s important to remember once again that PET container production involves lower CO<sub>2</sub> emissions than other materials. SFL EVO (as well as XTRA) has been designed to easily process rPET (post-consumer recycled PET), and blow preforms from the XTREME RENEW system, which begins with flakes. Both the oven heating and blowing processes are perfectly suitable for matching high sustainability requirements. Reducing use of fossil oil is the best way to reduce CO<sub>2</sub> complementing the benefits of lower energy consumption and improved scrap reduction.

# SIPA STARTS UP MOLD REFURBISHMENT AND CONVERSION CENTER AT NEW PLANT IN BRAZIL

SIPA has begun refurbishing and converting injection molds for PET preforms at its new South America Refurbishment and Conversion Toolshop in São Paulo, Brazil. SIPA recently moved into the location, which also serves as its South American hub for sales and technical service.

The new operation covers an area of 1100m<sup>2</sup>, full of equipment incorporating the very latest technologies, providing SIPA mold experts with capacity to upgrade at least six molds every month. VP Brazil & Conosur Director at SIPA Sul America, emphasizes that SIPA will work on molds made by any major preform mold maker, not just SIPA itself. "In fact, most of the work we are likely to carry out here will be on molds from other suppliers," he says. "This is very much in line with the way things work at our other mold refurbishing and converting operations around the world." Today, SIPA operates mold refurbishing centers at its headquarters in Vittorio Veneto, Italy, as well as in the Americas (Atlanta and Los Angeles in the USA; São Paulo in Brazil, and San Luis Potosi, Mexico) and Asia (Bangkok, Thailand China, Guangzhou and Tokyo, Japan).



The company's most recent investments, not just in Brazil but also in the USA, have proven to be hits with customers, with major projects being carried out for some of the most important PET preform producers in the continent. SIPA already has a strong reputation in South America, just like it has in other places around the world, for its expertise in refurbishing molds. In fact, it has already carried out work for such well-known PET preform makers as Lorenpet, Plastipak, and Engepack, as well as other major converters. SIPA uses the slogan "Works like the first day" to send a strong message to customers that by the time its technicians have finished their expert work on molds in need of repair or an upgrade, the molds will run just like a brand-new mold. The company refurbishes hot halves and cold halves. The biggest call comes from users of large molds, typically with 96 or 144 cavities. "Not so long ago, we took on a project for complete cold-half refurbishment on a 144-cavity mold," says SIPA Sul America's director. "It took us less than two weeks to have the mold back up and running, performing as if it were brand new."

Customers have a range of options when they want to optimize a mold. They can have a regular refurbishment, with old components being replaced by new ones to ensure ongoing preform quality; or they can choose to have the mold converted to produce a completely new, most likely lighter, design of preform.

SIPA Sul America's customers want a reliable and competent supplier for this type of service, a partner who can provide them with a highly cost-effective way of upgrading production without having to make a major investment in completely new tooling. They know this is what they get from SIPA, now more than ever.

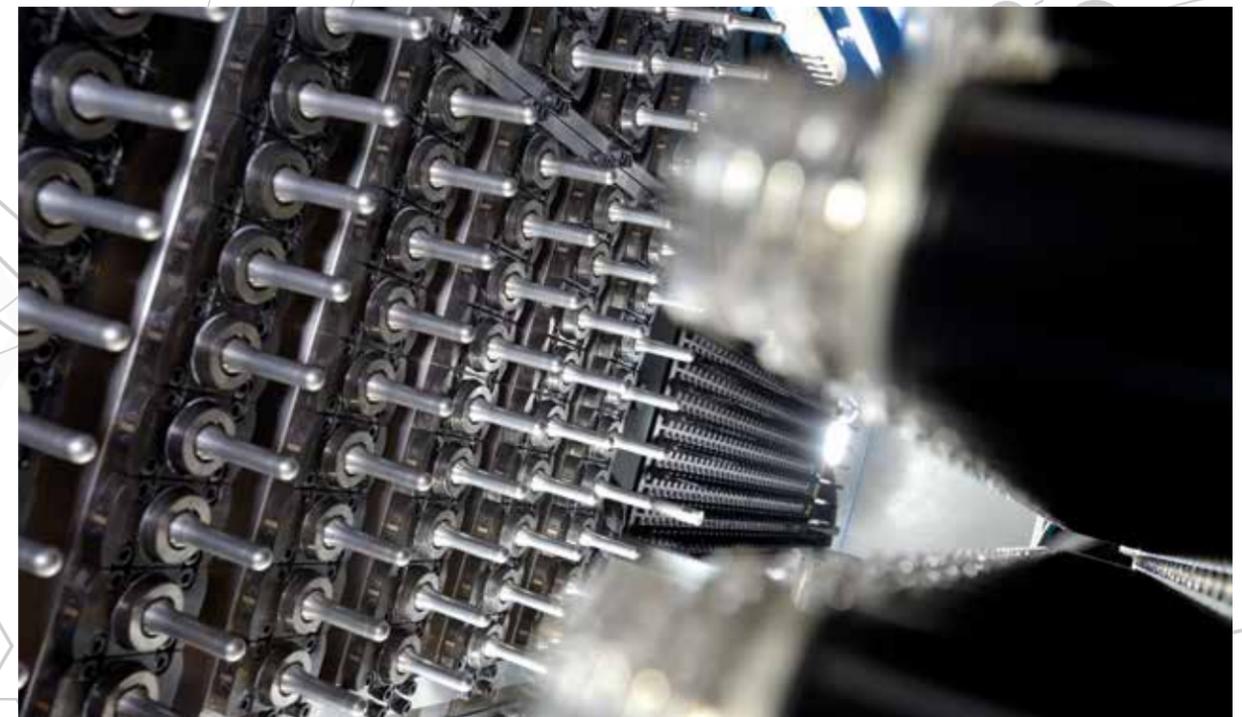
Customers can also benefit with SIPA's LCS Life Cycle Service, a comprehensive package of services aimed at increasing the overall effectiveness of customer operations, through such activities as improving the reliability and availability of equipment, analyzing productivity and part quality, improving personnel performance, and collaborating on planning.



# XFORM IS MORE OPEN THAN EVER

One of the great advantages of SIPA's XFORM PET preform injection molding system is its openness. XFORM stands out from other important brands in the global marketplace in its ability to accept preform tooling from other major producers.

Obviously, SIPA believes that it produces the best PET preform molds in the world, and likes it best when customers run XFORM machines with SIPA molds. But there is a lot of legacy tooling still being used, and SIPA wants preform producers to get the most out of it. Now, SIPA is making its XFORM machines even more welcoming. When it comes to PET preform tooling, there is often a lot more to it than just the mold. That's why the new XFORM 250 GEN 4 XP preform injection molding system not only accepts non-SIPA molds and EOATs, it also accepts pin plates for preform cooling and removal coming from alternative suppliers. XFORM was conceived as a flexible, versatile, welcoming system. With this latest development, SIPA is going the extra mile to help our customers get the most out of complementary equipment in which they have already invested good money. SIPA's Global Sales Director, Preform Systems & Tooling says "We are entering a period of great uncertainty. Buying decisions are going to be harder than ever to make for companies in a highly competitive business like rigid packaging. SIPA is doing its best to help customers get the biggest bang for their bucks. Allowing them to use their existing pin plates on new SIPA machines is the latest example of how we are trying to make their lives a little bit easier."



# XACTIVE- CLEANING CUTS DUST IN PET PREFORM HOT RUNNER SYSTEMS

PET preform injection molding is a highly competitive business, so production efficiency is critical to success. Systems needed to be up and running as much as possible, making preforms as perfect as possible. The hot runners in the mold are a fundamental element in the total system, so any anomaly in their operation can compromise output.

In addition to mechanical or electrical issues that can affect the efficiency of a hot runner system, there is also another problem that processors should be well aware of: dust. Over time, PET powder builds up on the inside the cylinders of the actuators. Initially, this powder does not cause any problems, but as it accumulates, it inhibits the movement of the pistons, eventually severely compromising the quality of the preforms. If not treated, this accumulation can cause the system to seize up completely.



cylinders, making sure that any PET dust particles created in the system are evacuated every cycle. This solution should on its own be sufficient to keep the system clean. But just to be absolutely sure, there is also a “boost” function that can be activated to perform a forced cleaning cycle, at intervals that can be set by the user (every 40,000 cycles for example). This process lasts for a few tens of seconds, so it has no impact on productivity.

### WHAT MODIFICATIONS TO EXISTING EQUIPMENT ARE NEEDED?

A hot runner system incorporating XActive-Cleaning includes additional channels within the plates themselves, so there are no obvious differences from a conventional hot runner system, apart from an additional air connection with the XActive-Cleaning device. The cylinders for actuating valve movements have a special design, and there is also some special pipework feeding

the box where the dust is collected. This box is located on the ground near the injection machine’s HMI zone. The connection between the XActive-Cleaning device and the machine is purely pneumatic. No changes at all are need to the injection machine.

### WHAT DOES THE OPERATOR NEED TO DO TO MANAGE THIS SYSTEM?

The XActive-Cleaning system is machine-independent and operates using pneumatic valves operated by the same circuit that manages the movement of hot runner valve, so no modifications are necessary to the pneumatic system. The only extra task that the operator has to carry out is the regular cleaning of the easy-to-access filters installed on the external box.

Important producers of hot runners have known about this problem for a long time, and a lot of work has gone into developing ways to counter it. SIPA is among the leaders in this area. It has developed solutions that keep production of dust to very low levels, especially when molding systems are running with virgin resins. But increasing performance requirements, and the growing use of recycle - rPET - are complicating the issue. For this reason, SIPA several months ago decided to take a new look at dust, and to devise an easier and more cost-effective solution to the problem.

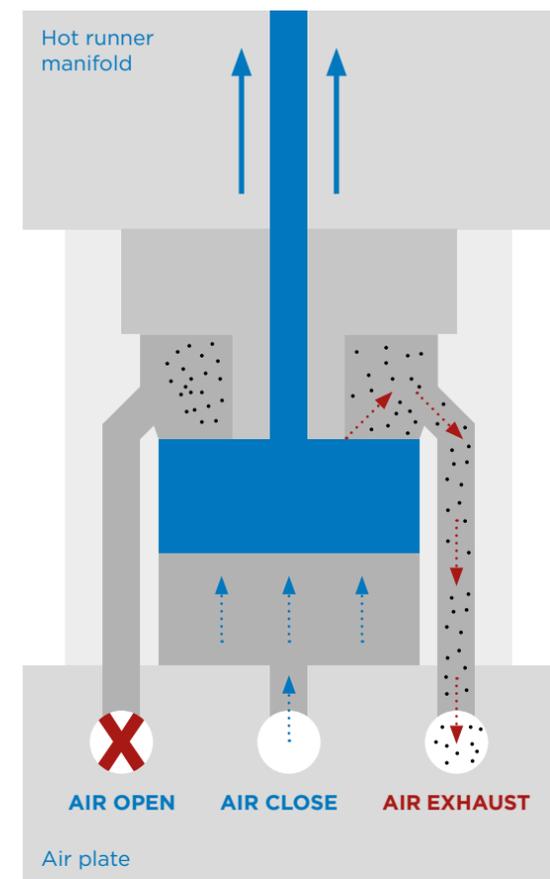
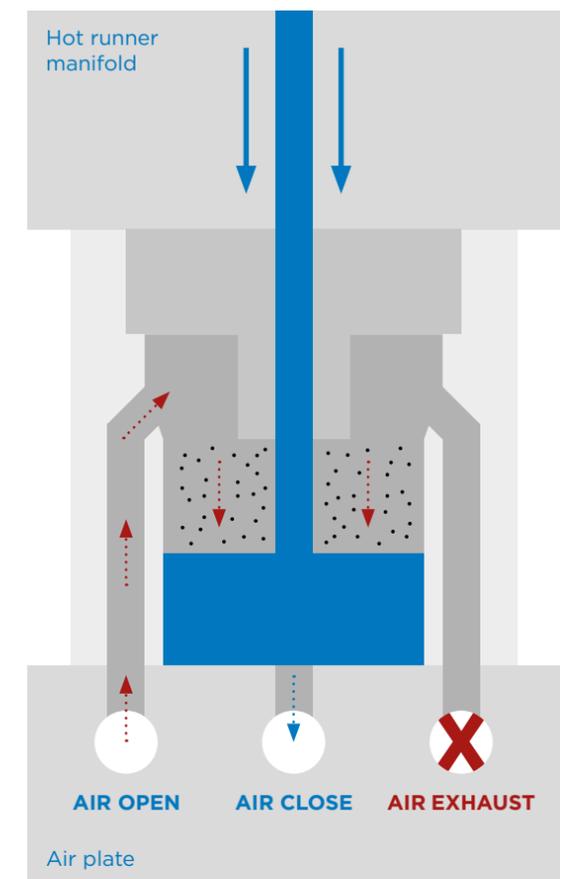
### SIMPLE AND SMART

“What we wanted was something that was smart and simple at the same time,” says SIPA’s Global Engineering Manager Injection Molds & Hot Runners. “Simplicity is key to ensuring that the risk of malfunction is minimized.” The highly ambitious goal was to have a complete hot runner system that needs maintenance only to

carry out standard renovation operations - that is, to replace worn components. A system that could run continuously for five million cycles before those moving parts subject to wear - piston seals, valves, and so on - needed to be replaced. In a system running with a cycle time of seven seconds, that means it would be able to work continuously for 10,000 hours. Guided by this vision, SIPA’s engineers came up with a system, which SIPA has since patented, which adapts the compressed air flows, normally used to move the hot runner valves, to also blow out the very few plastic particles that deposit inside the actuators each cycle. SIPA calls the system XActive-Cleaning.

### HOW DOES XACTIVE-CLEANING WORK?

The hot runner system is equipped with a supplementary circuit incorporating a series of valves which, controlled with appropriate logic, govern the entry and discharge of air from the





**PETWORK:**  
concept, design, engineering,  
what's new in packaging world

04

Villi

SIPA  
HELPS  
FINN  
SPRING  
TACKLE  
WILD  
WATERS



# Innovative Finnish drinks company Finn Spring has returned to SIPA for design development and engineering of its latest bottle, for a spring water called Villi. SIPA has also supplied the molds to make the containers.

Packaging for Villi spring water is very special, with a simple shape enriched by a completely customized texture reminiscent of the bark of Finnish birch trees. The texture is also nuanced to provide a slight haze, giving a truly unique touch to “the world's wildest packaging.”

Villi is Finnish for wild, let it be known! Bottle production is carried out on an SFR8 rotary stretch-blow molding system that Finn Spring has been using for over ten years; and on an SFR6 Sincro coupled to an Isofill filling unit, which Finn Spring took delivery of last year. Finn Spring also has two linear SFL 4/4 units, used on other projects.

Finn Spring puts Villi spring water in bottles made from 100% recycled PET - a first in Finland. The bottles, which are of course recyclable, are produced in three sizes: the SFR6 Sincro makes smaller bottles, 330mL and 500mL, while the SFR8

produces bottles sized 1500mL. The water is offered in still and carbonated versions.

One of our responsible choice is that we compensate the carbon foot print of Villi entirely by investing in emission free energy projects. That's why Villi bottled waters are produced using only renewable energy. Electricity that Finn Spring buys is produced by domestic wind power and approved by the Finnish Association for Nature Conservation; the company also produces solar energy with its own solar panels. Finn Spring, which is a family business, says Villi was created together with two generations, “for family company responsibility and caring for the environment have always been an integral part of the worldview.

Our goal of ensuring the availability of clean spring water for future generations is crystallized in Villi.”



# PET PUTS THE SQUEEZE ON TOP OLIVE OIL



One of the best-selling extra virgin olive oils in Italy now also comes in PET bottles. Monini, located not far from Perugia in the center of the country, packs its Classico product in two sizes of PET bottles, 450 and 650 mL. The bottles, which complement glass bottles in other sizes, are produced on SIPA SFL 4/4 linear blowmolder.

The great thing about the PET bottles is that they are squeezable. Extra virgin olive oil is precious, so you want to be sure to use it in the right amounts in your salads and cooking. The PET bottles are light (28g for the 450-mL version) and they have a special top, so dosing is really easy to control. And of course they are virtually unbreakable, which is another key advantage in the kitchen, or possibly at the picnic.

The PET bottles also look great too, with their green color that matches Monini's glass bottles. But compared with glass, they take less energy to make and transport. It almost goes without saying that the PET can be recycled once the bottles are empty.

"We paid close attention to designing these PET bottles to look very much like the glass versions, to provide a strong shelf impact and to preserve the strong brand recognition that Monini has built up over the years," says SIPA's Packaging Designer. Monini was founded 100 years ago, by Zefferino Monini, and has always specialized in extra virgin olive oil.

SIPA designed and engineered the bottles for Molipack, Monini's converter. "We believe the effect that we have achieved is extraordinary and increasingly confirms the fundamental importance of PET material in the edible oils market," says the designer.





# Bringing recycling and design together

Think about the expression “Design for Recycling.” What does it mean? For most people, it means designing a product, or an assembly, so that it can easily be recycled.

That often translates, for example, into using only one material, or possibly materials that are compatible with each other, and designing the product in a way that it is easy to take apart once the product has come to the end of its useful life - so that the individual components can be recycled or possibly reused, preferably in the same type of product they were used in the first time.

We hear about design for recycling especially when it comes to technical parts used in automotive and electronics. But it can also be applied to the packaging world: designing packaging that has high barrier without the need for multiple layers, for example, or using labels that are easy to remove or possibly in the same polymer as the container itself. Maybe even making caps and closures in the same polymers as the bottles.

But there is another way of looking at designing for recycling, one that is more appropriate for us in the world of PET bottles. What we mean here is more designing with recycling; that is, taking post-consumer recycled material, PCR, or RPET, and creating designs that make the best use of its particular properties.

Of course, in an ideal world, the properties of the RPET would be the same as those of virgin PET.

**We are getting very close to that situation with XTREME RENEW, the technology co-developed**

**by SIPA with Austrian recycling technology specialist EREMA, which takes flakes back to preforms in a single fully integrated process.**

But XTREME RENEW, with its innovative use of injection-compression molding technology for preform production, is not yet in widespread use. So we are having to contend with rPET that is often of a quality noticeably different from virgin PET, which may have to go through solid stating to get its viscosity back to the right level for preform production, and which most likely does not have the same water-white clarity as virgin PET.

So what can we do with this rPET to maximize its value? As more rPET becomes available, bottle design is undergoing a huge development, confirming itself as a vehicle for innovation for many companies in the sector. In recent months, for example, SIPA has brought to fruition an increasing number of design projects developed for rPET, overcoming major hurdles as it did so (see accompanying article).

SIPA's head of packaging design office, says: “For us designers, it is extremely challenging to work on bottle development projects in rPET. Constant dialogue with injection engineers, as well as the access we have to XTREME RENEW technology, are proving to be a fundamental support in taking these projects forward. The challenges from the market, however, are not lacking: for example, we need to turn the particular color of recycled PET to its advantage, this iridescent shade, which spans shades of grey to yellow and aquamarine green.”

There is also the challenge of working with customers and design agencies to find new materials and colors for labels and caps that can make packaging in rPET totally in tune with the circular economy, based 100% on recycle. And all the while we are waiting for harmonization in legislation across borders that will facilitate the use of 100% sustainable packaging based on PCR in food-contact applications.

# Bleach-resistant bottles in rPET

“SIPA HAS BEEN WORKING ON DEVELOPMENT OF ONE-LITER BOTTLES IN rPET THAT CAN BE USED FOR PACKAGING HOUSEHOLD BLEACH.”

These bottles are normally blow molded in high-density polyethylene, HDPE, but in-house tests with different concepts have shown that it is also possible to use rPET with very good results.

One of the concepts, which uses rPET compounded with titanium dioxide,  $\text{TiO}_2$ , to provide a clean white color, resisted duration tests at 45°C for 2 weeks when filled with bleach containing 4.5% sodium hypochlorite, which produces its bleaching effect through oxidation.

Other concepts are also being considered. The development, thanks in part to the performance of the XTREME preform injection molding platform, has achieved very good chemical resistance and provides excellent aesthetics when blown on an SFL machine.





## **SUSTAINABILITY**

Technologies and actions for recycling in a view of circular economy.

# 05

# HOW TO MAKE GOOD PREFORMS AND BOTTLES IN RPET, ALWAYS

PET bottles containing post-consumer recycled material will soon be the norm, not the exception. European Union law says that from 2025, PET beverage bottles will have to contain at least 25% rPET (calculated as an average for all PET bottles placed on the market within any member state). That figure will rise to 30% from 2030. Similar pieces of legislation are being introduced in other regions of the world too.



## rPET MUST BE CLEAN AND CONSISTENT

This trend, a response to growing concern about the scale of the global plastics waste problem, presents an important challenge for the entire PET bottle production chain.

Containers incorporating rPET will only be accepted by brand owners and consumers if they perform as well as containers made from virgin material. That means rPET arriving at the converter has to be clean and consistent, and with processability during preform injection molding and bottle blowing that is virtually if not exactly the same as virgin PET.

SIPA has been working for a long time now to help ensure that these demands can be met. It now offers a range of solutions that make it possible to make bottles with as much as 100% rPET.



## XTREME RENEW IS A RADICAL SOLUTION

For example, the joint development between SIPA and Erema on the Xtreme Renew process incorporates ground-breaking technologies that enable rPET to be converted in a fully integrated system directly into injection-compression molded preforms. But this is just one option, and it does require investment in equipment that many converters are unfamiliar with.

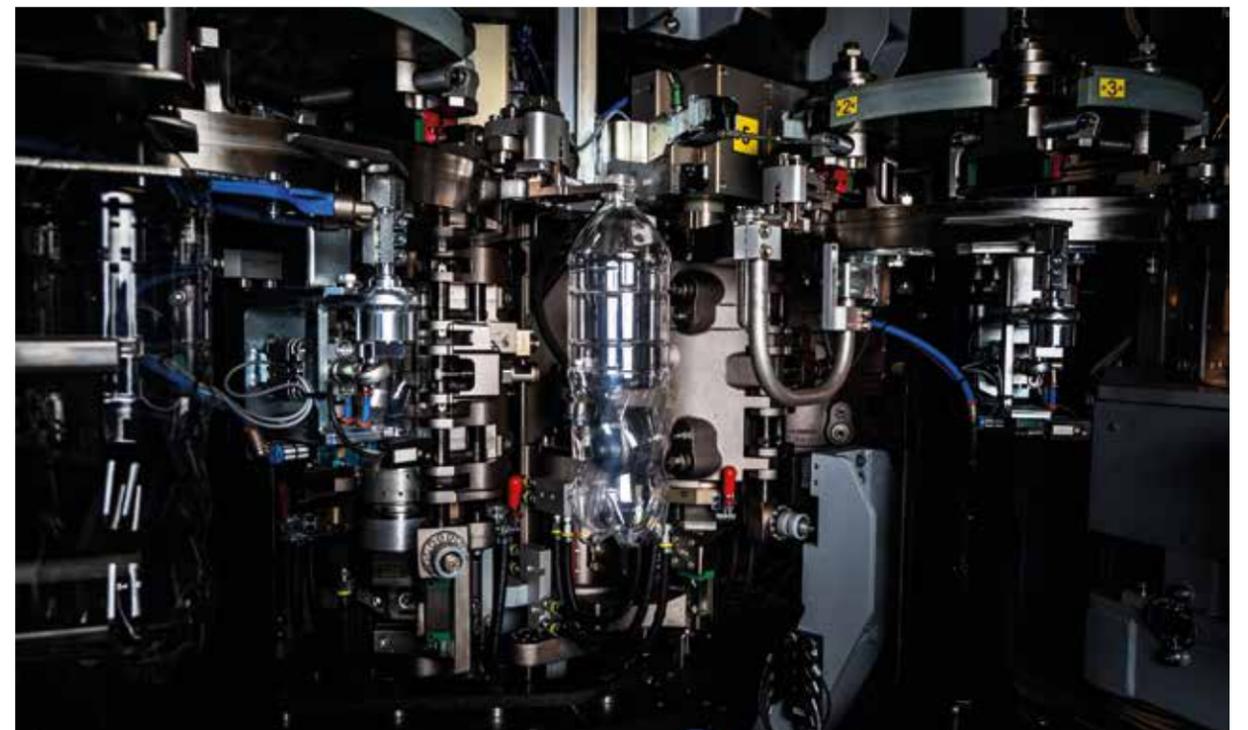
## CONVENTIONAL TECHNOLOGY CAN BE GOOD TOO

So for customers that prefer to venture not so far from their comfort zone, SIPA can supply more conventional XFORM injection molding systems, and SFL or XTRA linear and rotary stretch-blow molding systems, incorporating special features that make processing with rPET a relatively simple affair. In many cases, customers will not even have to invest in new systems, but rather make highly affordable adjustments to equipment they already have. But they will still be able to produce bottles with up to 100% rPET if they so choose (and if the application allows).

## MODIFIED HOT RUNNERS

For converters producing preforms, for example, it will make a lot of sense to use hot runner systems that have been upgraded to prevent accumulation of PET powder - an issue that can be more of a problem with rPET than it is with virgin PET. SIPA has developed XActive-Cleaning, a system which we describe in a separate article in SIPA SPEAKS.

Cleanliness is an issue not only in hot runner systems, but also in the injection molds that they feed. So SIPA has also been developing ways to keep mold cavities as clean as possible. A system incorporating innovative vacuum technology reduces the need for maintenance and increases line efficiency.



## KEEP MOLD AIR VENTS OPEN

All molds incorporate tiny vent holes at key points on the surfaces of the cavities, to allow the escape of air in the cavities when the PET is injected. The vents are large enough to allow the air out but small enough to keep the PET in. But the vents can become dirty and blocked if the air flowing through them is not completely clean. It is necessary to take into account the contamination caused by gas coming off from the PET melt, which condenses on the surfaces of the vents. Stopping production to clean the vents can take several hours. In conventional systems, it may have to be carried out once or twice a week, depending on the application and the resins used.

## SYSTEM PULLS A VACUUM BEFORE INJECTION

SIPA has patented a solution that pulls the air out of the mold just before injection. In this way, the energy needed to empty the cavity is considerably reduced, while at the same time the blockage of the mold is limited. Net result is that the need for operations to clean the vents is also drastically reduced. Once the preforms containing rPET have been produced, it is then a question of turning them into bottles. SIPA's XTRA and SFL systems have both been proven to stretch-blow preforms containing the highest levels of rPET without problem.

## TAKE RPET COLOR INTO ACCOUNT WHEN BLOWING BOTTLES

It has to be said that rPET preforms are not all the same. Because the material is coming from a variety of sources, it is quite possible that there will be, for example, slight variations in color. This may affect behavior when the preforms are heated in infrared ovens, since different colors absorb different amounts of infrared energy. SIPA has developed ways to take account of such variations - making automatic adjustments to the oven settings for example - making it possible to have a very high level of consistency in the way the preforms behave when they are formed into their final blown shape.

Preform heating can be adjusted from one batch of preforms to another, based on the variation in color. Related to this, special vents, known as X-Vents, can be inserted into the molds, making it possible to manage pressure changes in the cavities caused by the process adjustments relating precisely to the different levels of energy absorption of the preforms.

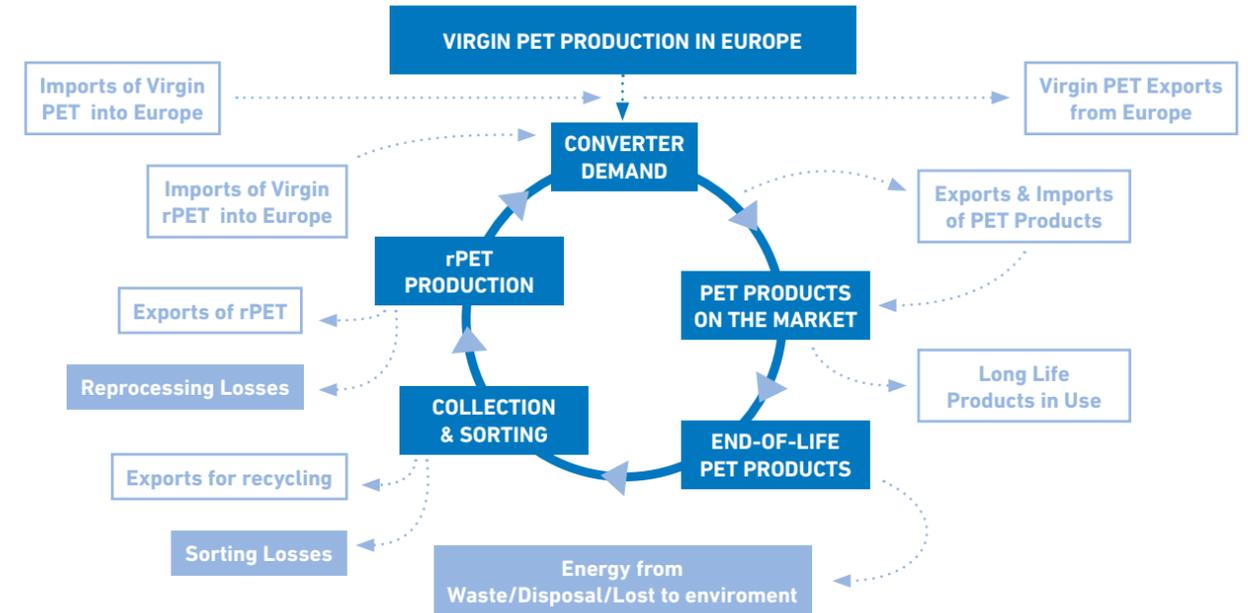
“Any increases or decreases in preform temperature can be balanced by controlled changes in pressure in the cavities,” says SIPA's Product Manager Blowmolding Systems, “so the specification of any container can always be ensured. The use of X-Vents is particularly useful for managing these situations when bottles with complex geometries are being produced, or for controlling the bases of bottles for carbonated soft drinks.”

Blowmolding Systems Product Manager also points out that the extra wide processing angle on the new generation of XTRA rotary stretch-blow molding machines provides further help in processing ‘difficult’ materials like rPET.

“All in all, we are adding flexibility to the management of preforms and bottles,” he concludes.

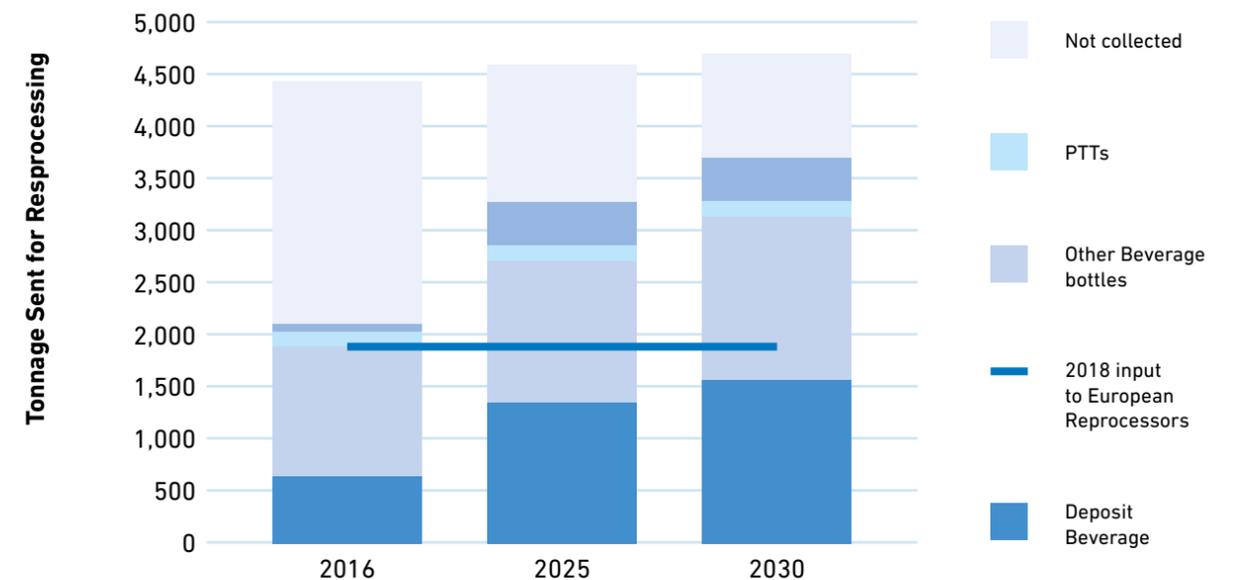
## THE SUPPLY CHAIN OF PET IN THE CONTEXT OF THE CIRCULAR ECONOMY.

The key elements are covered in our analysis of the PET market within this section.



## REPROCESSING CAPACITY AND RPET PRODUCTION

The project changes in collected PET in 2025 and in 2030. Potential Increase in PET Sent for Reprocessing by 2030.



WE  
CAN BE  
**(CIRCULAR)**  
HEROES



This is where we start over. Let's fix a point of return. But first let's challenge our comfort zone, now. We can live well without being sucked into ultra-consumerism. The economy must be aware of the environment to be sustainable. We must respond to problems now to reduce distances between us and a future that seems to be moving further away.



This is the world we imagine today, a more aware world for living in. As citizens, as consumers, as workers, as SIPA with this manifesto we declare our desire: let's change a linear system that no longer brings any benefits. We have a circular economy, inspired by the shape of the Earth, a never-ending circle. This is a new start, where everything returns. Let's stop living on credit from our planet and future generations. This is where we start over.

**Plastic has reached an unprecedented critical moment in its history.**

Discarded, dumped, not recycled. At sea, in the street, everywhere. According to Greenpeace, only a very marginal portion of the plastic produced worldwide (9%) is actually recycled. This is an impressive statistic figure, evidenced by the pollution affecting our oceans, sad protagonists of today's news on which huge plastic islands are floating.

**After decades of linear, single-use economy, have we reached a point of no return?**

There is more and more talk of putting an end to plastic use. However, if we were to eliminate plastic from the world today, we would lose a great resource for food packaging: this would have very serious consequences for the planet and for human beings. Plastic, in fact, helps to protect food and drink against contamination, guarantees safe transport and above all, it costs much less than any other material without particularly affecting the final price of the objects we buy.

Thus, the real problem is clearly not in the plastic itself, but in the way it is handled after consumption. Increasing its recycling and promoting its sustainable use is the only way to ensure that we use this material in a safe way and thus to save the world. And you know what? We can all save the world, because we can all be Circular Heroes.

SIPA, one of the most influential global players in the PET sector, has launched a web-based awareness project called Circular Heroes: small circular economy actions aimed at recycling, to demonstrate how we can all engage concretely for a new beginning. Just like real everyday heroes, but with no need for superpowers.

Anyone can save their own future and that of others simply by making the right choice and correctly recycling every plastic bottle.

The Circular Heroes wave involves Facebook and Instagram, and the website <https://circularheroes.sipasolutions.com> that also reports the project's mission:

**“To stop living on credit from our planet and future generations: we can no longer hold back. Let's start from here, from an environmentally friendly and circular economy. For a never-ending sustainable tomorrow”.**

A strong and clear message, a powerful commitment from SIPA that takes on a social responsibility with a “green” imprint and thus becomes the leading company in the PET sector to wave the flag of change. And if Circular Heroes are the voices shouting this message, Alex Bellini is the absolute main player.

For some time now, our company, based in Vittorio Veneto, Italy has been sponsoring the Italian explorer's mission called 10 Rivers, 1 Ocean #weareallinthesameboat, a journey on the world's most polluted rivers and oceans to show just how far humanity has gone and trace a starting point for our return.

In other words, the circular economy highlights the planet's critical points and shows a hopeful curve that is still attainable.

**SIPA shares the thinking of its true Circular Hero and supports his activities. We still have a chance before we reach the point of no return: it is our ability to choose, to do the right thing. Anybody can become a Circular Hero and save the environment every day, simply by recycling without a mask of cape.**

**SIPA**

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