SIPA SPEAKS

SIPA

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LIFE IS A CIRCLE

This edition of SIPA Speaks was produced as COP26, 2021 United Nations Climate Change Conference, was coming to an end. Whatever was agreed at the event in Glasgow, it appears clear that we are close to tipping points on land, ice, and sea that could dramatically change life on earth. Not in our lifetimes, maybe not in those of our children, but quite possibly in those of our children' children. We should all be doing our bit to make sure we never reach any of those tipping points.

We in the PET packaging sector are in the crosshairs of many environmentalists because for them, there is only one thing worse than plastic, and that is single-use plastic. And until today, PET has very much been a single-use plastic. This has to change.

Much more needs to be done to ensure that used packaging does not end up in the environment, to manage waste packaging, to sort recovered waste into streams pure enough for mechanical or chemical recycling, and to use recycled plastics in high-value applications – preferably the applications that the virgin plastics were first used in. Much of the technology already exists to make this come about. It is unfortunate that what is still missing in many situations around the world is the infrastructure to supply PET recycling plants with sufficient material; hopefully, this situation will be remedied soon.

As anybody who knows SIPA understands, SIPA wears its heart on its sleeve when it comes to sustainability. In this issue, we show yet again how we are championing the cause. On a technical front, SIPA continues to develop new and better technologies that will make PET packaging more sustainable, while commercially, we continue to be highly active in conversations at all levels relating to the Circular Economy, of which we are a strong supporter.

Thanks in no small part to lobbying by SIPA, a law has now been passed in Italy enabling 100% rPET bottles to be produced in the country for use in food contact applications. An important SIPA customer headquartered in Italy recently launched a brand of mineral water in a 100% rPET bottle.

SIPA's product design experts are involved in the development of thousands of new packaging designs every year. The three R – Reduce, Reuse, Recycle – are constant principles in all these projects. In the Sustainability section of this edition of SIPA Speaks, we discuss a new brand, AWArPET, which stands for an environmentally conscious approach to the design and production of PET packaging. AWArPET bottles are lighter than ever. SIPA has for example been involved in one design project for a one-liter water bottle weighing just 16g, far lighter than most 1-L bottles currently on the market.

In one of our reports from around the globe, meanwhile, we talk about the ability of SIPA's XFORM preform injection molding system to process 100% post-consumer recyclate, and why innovative Canadian mineral water supplier Ice River Sustainable Solutions ordered a 500-tonne version that went into production in August. This family-run company was the first beverage company in North America to purchase "blue box" materials to produce its 100% recycled plastic bottles – creating bottles made from bottles.

Use of rPET also figures in an article about bottles for water being made by Danone in Poland. Not only are the bottles made in rPET, but they are also extra-easy to recycle because they have no labels that need to be removed – all the decoration and information is embedded in the bottle walls.

AROUND THE WORLD:

news from the different continents.

Italchimica

ITALY

THE HOUSE OF CLEANING TAKES A SHINE TO SIPA

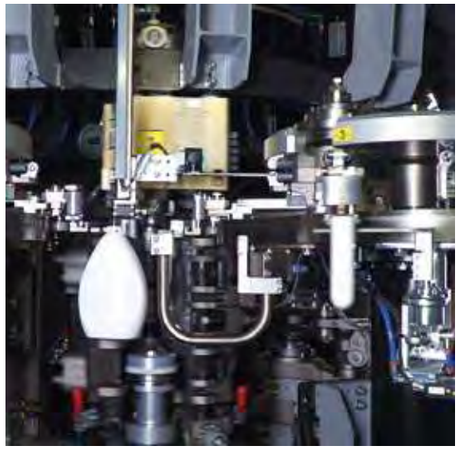
Just 20 years ago, Italchimica was starting its business from the owners' garage in Padua, Italy. Today the company has grown substantially and it's building a green future. It produces produces disinfectants, detergents, degreasers, and the like and has recently invested in equipment that allows it to consistently produce and package high-quality products that are well respected by the trade and consumers. And it has just invested in a new XTRA 6 rotary stretch-blow molding system from SIPA.

The XTRA 6 is being used to make 600-mL and 1000-mL bottles for hand sanitizer – a product for which demand has risen substantially in recent months for reasons that are well understood. Italchimica's sector-leading Sanitec branded products can be found across Italy in schools and public administration locations.

The innovative equipment from SIPA stands out for its output and energy efficiency. At Italchimica it produces up to about 8000 bottles 600-mL bottles every hour, and almost as many (7500 b/h) 1000 mL bottles.

Italchimica has been producing these bottles for some time on other pieces of (linear) equipment, but it needed a system with higher output. The XTRA 6 delivers on this requirement, it makes very high quality bottles, and Italchimica also appreciates its reliability.

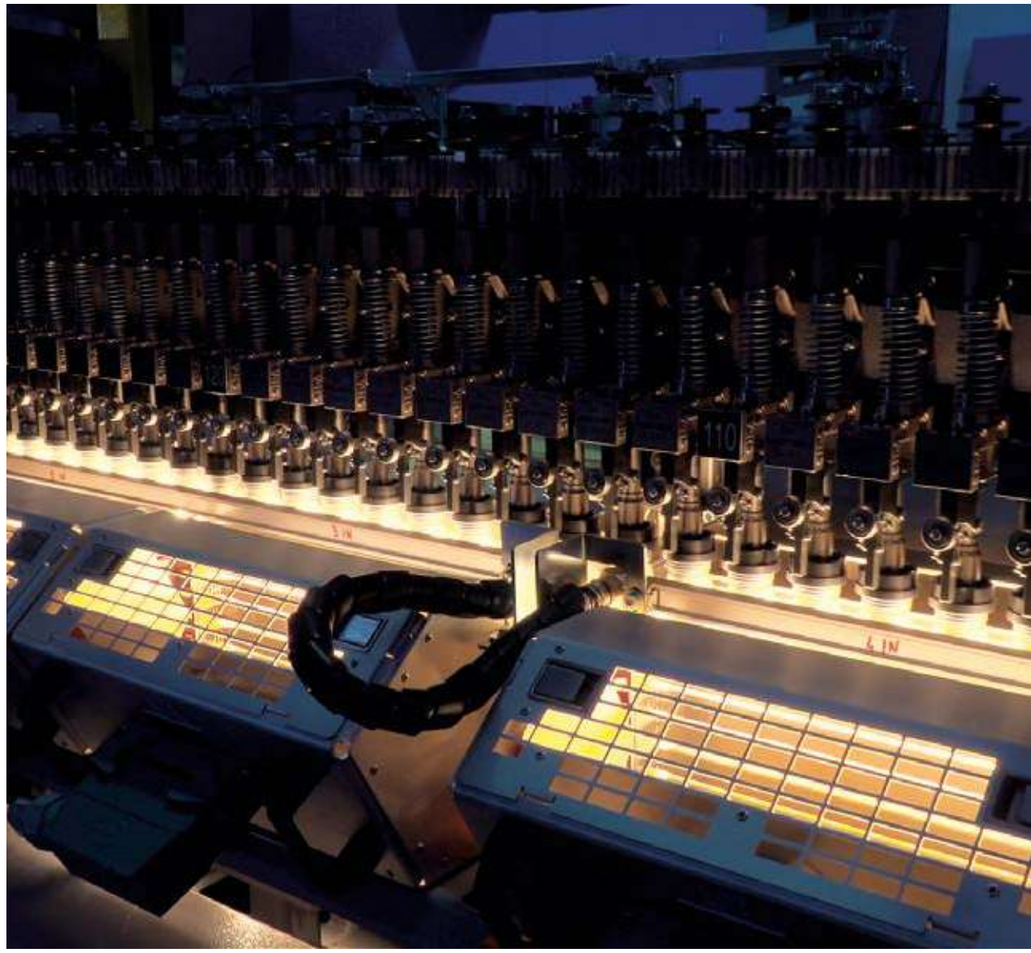
"Everything is looking positive, SIPA did a good job during the installation and start-up," says Italchimica co-owner Marco Fioretto. "We have established a good relationship with its people." Discussions have already begun about a possible second line.



The innovative equipment from SIPA stands out for its output and energy efficiency. It can produce up to about 8000 bottles for 600-mL bottles every hour, and almost as many 7500 b/h for the 1000 mL bottles.

Preferential heating

The XTRA is particularly good at blowing bottles with asymmetric cross-sections – ovals, for example, or even more complex shapes. So-called Preferential Heating (PH) enables an even wall distribution all around the circumference. The concept is not unique to SIPA, but what makes its PH ovens different from others has to do with the way the preforms rotate as they pass through them. The ovens have two distinct, highly controllable, infrared heating zones. In the first, the preforms rotate as usual, reaching a certain minimum temperature around their circumference. In the second, the preforms stop rotating, and certain parts of the circumference come out of the oven hotter than others. These are the parts that under normal conditions would stretch less in the blow mould.
Using a standard heating process on a complex container would result in some areas around the finished container unnecessarily thicker than others. With Preferential Heating from SIPA, that problem disappears.



SIPA SATISFIES THIRSTI

THIRSTI™
NATURAL SPRING WATER

SOUTH AFRICA

Some of the most stylish bottles for mineral water and soft drinks in Africa are made by THIRSTI. Located next to a natural spring at the foothills of the Klein Drakensberg (Afrikaans for Small Dragons' Mountains) in South Africa, THIRSTI is one of the largest mineral water suppliers in the country.
The bountiful spring sustainably yields millions of liters of wonderful tasting water every year, and the company ships it all around the country. The bottles go out of the plant under THIRSTI's own name as well as being branded for some of South Africa's top supermarkets.
Production began at the end of 2015 with ranges of still and sparkling water. 2019 saw the release of the ISOFIT+ Sports Drink, and THIRSTI Flavours were added in 2020.
SIPA support started with a study for new packaging, taking advantage of SIPA capabilities in packaging design and weight optimization. SIPA team made several proposals for new bottle designs for still and sparkling water branded for an important South African Retailer.

> **Located next to a natural spring at the foothills of the Klein Drakensberg in South Africa, THIRSTI is one of the largest mineral water suppliers in the country.**

Only after came the machines with the aim of replacing old systems and increasing the production for THIRSTI ‘s own brand and also for supermarket brands.
THIRSTI is today a big user of SIPA bottle making and filling equipment. It runs several SIPA linear stretch-blow molding systems, as well as Isofill lines for bottling carbonated water and soft drinks.
In the beginning, THIRSTI brought in bottles from various converters around the country to feed its filling lines through an unscrambler. Then, in line with its objectives to keep its carbon footprint as low as possible, it began bringing bottle blowing in-house. The move also helped it bring down raw material costs, reduce consumption of secondary packaging, simplify logistics, increase production flexibility of its plant, and optimize bottle designs. SIPA is its exclusive supplier of bottle making equipment and partner on this journey.
Most THIRSTI water goes into bottles from 300ml up to 1.5L in size, but for still water, bigger 5-L bottles are also a top seller. These bottles are bundled together for shipments using stretch film, which has a lower total cost than shrink film: around 40% less film is needed for one pack, and there is no need for high energy consuming shrink ovens.

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제주특별자치도개발공사
JEJU PROVINCE DEVELOPMENT CO.

SOUTH KOREA

SIPA LEADS THE PACK IN MAJOR PRODUCTION UPGRADE FOR TOP KOREAN MINERAL WATER SUPPLIER

SIPA has completed an important installation for producing, filling, and packaging PET bottles made using PET injection-compression molded preforms at major Korean beverage company Jeju Province Development Corporation (JPDC). The installation at the JPDC production plant in Jeju City on the volcanic island of Jeju was completed on-schedule, despite inconveniences created by the global COVID-19 pandemic.

With strong support from the Project & Production Team at JPDC, SIPA succeeded in installing and commissioning the line, known as L2, right on time. The Head of the Samdasoo Production Center at JPDC told the JPDC and SIPA teams : "I would like to express my deep appreciation to all of you for your great support to bring the project to successful completion." Jeju Samdasoo is the brand name for the company's spring water. It is Korea's favorite bottled spring water, with a market share of around 40%.

With its latest line, JPDC is implementing innovation in PET bottle production through improved safety as well as reduction of plastics usage. The original L2 production line went into operation in 1998, when JPDC launched Jeju Samdasoo. That line came to the end of its useful life in September 2020, and work began immediately to replace it with an all-new line. JPDC allocated eight months to the job. Now, the L2 line has been reborn with state-of-the-art facilities to ensure workers' safety and meet the rapidly changing needs of consumers.

The new L2 line has a flexible production system that can produce bottles in five sizes 330mL, 500mL, 1L, 1.5L, and 2L; the 500-mL bottle comes in two versions, the second one known as Murabel (No Label).

“SIPA has completed an important installation for producing, filling, and packaging PET bottles made using PET injection-compression molded preforms at major Korean beverage company Jeju Province Development Corporation (JPDC).”

Electronic automation has led to fast changeover speeds when switching from one bottle size to another, while also improving the working environment of line operatives.
In addition, because the Jeju Samdasoo bottles are filled as soon as they are blown, without an intermediate storage process, this can significantly reduce defect rates caused by such events as bottle crushing.
SIPA has also helped JPDC with a new preform design that takes advantage of SIPA’s XTREME injection-compression molding technology used on the L2 line. This has enabled JPDC to reduce the weight of its 330-ml bottle by 2g, taking it from 18g to 16g. This is the first time that XTREME technology has been used in Korea.
SIPA has installed a line that goes all the way from preform production to wrapping of pallets stacked with bottles full of Jeju Samdasoo mineral water. The preforms are made on an XTREME system capable of producing up to an almost incredible 42,000 16-g preforms every hour. The preforms are sent to an automatic storage system via an automatic conveying system. They can stay here for up to three days, before passing to the filling line via a second automatic conveying system. The filling line has an output of up to 26,000 bottles per hour, depending on bottle size. JPDC has a current output of 3300 tonnes per day across its production lines.

Bottles are blown on a previously acquired stretch-blow molding unit. They are then sent via a SIPA air conveying system to the labelling/filling/capping/inspection/shrink wrapping/palletizing/pallet wrapping line, again completely installed by SIPA. Larger bottles also have handles automatically attached to them – once more, using equipment installed by SIPA.
For the new L2 line, securing workers’ safety was given top priority. In accordance with the JPDC’s “safety first, then production” management policy, double safety devices can be installed in all areas to further reduce the risk of possible accidents. For example, three-beam photoelectric safety barriers have been installed in key areas of the line to prevent workers from directly accessing certain elements without the line stopping.
Jeju Samdasoo mineral water comes from 420 meters under the ground. Rainwater and snow falling on the island is filtered naturally by the island’s ancient volcanic rock, which was formed around half a million years ago. The source sits under a superbly-preserved primeval forest near Hallasan National Park, far from any pollution.
The volcanic rock on the island has created the earth’s largest natural water filter, says JPDC. According to a 2001 study by the Korea Institute of Geoscience and Mineral Resources, the water in Jeju Samdasoo bottles is 18 years old – in the sense that it takes that long to pass through the rocks before it is brought back up to the surface.
Jeju Samdasoo is claimed to be the best water for coffee and tea, thanks to its purity and the minerals dissolved in it. In particular, when green tea is brewed in Jeju Samdasoo, it has a beautiful clear color and is full of healthy ingredients. Coffee too has an excellent taste and aroma.

TURKEY

SIPA HELPS ŞIMŞEK PLASTIK STAY STRONG ACROSS MANY MARKET SECTORS

Major Turkish converter Şimşek Plastik has made an important investment in SIPA single-stage injection-stretch blow molding technology. In April of last year, it acquired an ECS SP 25 unit with four cavity molds set for its plant in Konya, around 270 km south of Ankara.

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The latest additions are 3 units of ECS SP 80 types, with different levels of cavitation: one has five molds, the second has six, and the third has nine. They will be used to produce bottles between 200 and 1000 mL in size, for very different applications, including detergent, Eau de Cologne, and beverages. Outputs are up to 2,700 bottles per hour.

"We wanted to replace some old machines and we were looking for an alternative to another supplier of ISBM machines," says Yasar Yildiz Account Manager for ISBM systems in the area. "The ECS units are robust, they can use up to 16 cavity for a wide range of containers or with 2 cavities 10 lt bottles with big pitch between cavities. Plus, they don't use a lot of energy."

ECS SP machines use a hybrid drive technology, obtaining precision and speed from servo-electrics like injection charging my Servo , while hydraulics perform more "workhorse" tasks. Result is an ideal combination of high performance and low energy consumption.

Molds are made by Stavax material and equipped in a standard configuration with valve-gated hot runners for production of premium quality containers. An important advantage for a company like Şimşek Plastik, which produces containers in diverse shapes and sizes, is that the same hot runner system can produce different types of preforms, with only the cold half needing to be changed. This saves money, as well as time at format changeovers.

Şimşek Plastik is among the leading companies in its sector in Turkey. "We are happy to add value to the products of dozens of international brands in many different sectors," it says. "With our internationally accepted production power in the sector, we have delivered Şimşek Plastik quality to many points of our country."

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ICE RIVER SEEKS OUT SIPA FOR NEW SUSTAINABLE SOLUTIONS

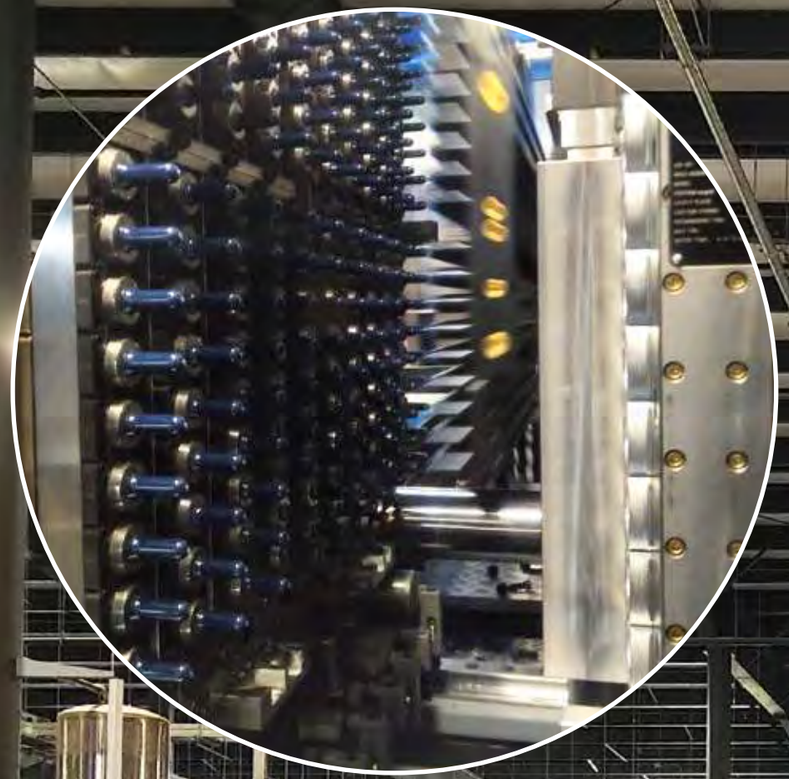
ICE RIVER
SUSTAINABLE SOLUTIONS

CANADA

The ability of SIPA's XFORM preform injection molding system to process 100% post-consumer recycled PET was just one reason why innovative Canadian spring water supplier Ice River Springs Water Company ordered a 500-tonne version that went into production in August.

The family-run company, which has recently rebranded to become Ice River Sustainable Solutions, has taken a lead in the use of rPET, even going to far as to establish its own recycling company. It was the first beverage company in North America to build it's own recycling plant and purchase "blue box" materials to produce 100% recycled plastic bottles – creating bottles made from bottles in a closed loop.

Ice River was founded in 1995, bottling water from the natural springs on its land in Feversham, ON. It now operates seven bottling plants, sourcing water from springs across the country.



The company's choice was an XFORM 500 GEN4, together with another SIPA special, a 180-cavity mold. The system produces close to 103,000 8.5-g preforms per hour, running with a 6.3-s cycle. The preforms are fed directly to a stretch-blow molding line making 500-mL bottles for natural spring water, with excess production being boxed for distribution. The fact that the picker runs independently from the press allows for optimized processing times. Justin Gott, Ice River's Engineering and Technology Director, says the XFORM 500 system was chosen for its high capacity and smooth operation as well as its energy efficiency. He also values the incorporation into the 180-cavity mold of new SIPA technologies to extend its lifetime, as well as the reduced maintenance requirements for both mold and machine.

Features built into the mold and hot runner system include self-cleaning mold tapers, pin valve self-cleaning, a special mold coating for extended life, and some innovative mold alignment features.

"It was the first beverage company in North America to build it's own recycling plant and purchase "blue box" materials to produce 100% recycled plastic bottles – creating bottles made from bottles in a closed loop."

TOP CHINESE MINERAL WATER COMPANY SIGNS LONG-TERM COOPERATION DEAL WITH SIPA

地川小Q®
深岩矿泉水

CHINA

Chinese luxury mineral water brand owner Luzhuoquan Mineral Water Co., Ltd. has just signed a strategic cooperation agreement with SIPA, the leading PET bottle production and filling technology company based in Vittorio Veneto, Italy.

The agreement was made official at a ceremony in Luzhuoquan Mineral Water's headquarters in Guanshan (Boluo County, Guangdong Province), on July 14th. Documents were signed by Wu Shenjian, Chairman of Luzhuoquan Mineral Water Co., Ltd., and Yang Jianlie, General Manager and Sales Director, Greater China, of SIPA Machinery (Hangzhou) Co., Ltd.

Luzhuoquan is already a highly valued SIPA customer. In the recent past, the two companies have worked together with many bottle developments projects every year. "Our good service and expertise are well appreciated by Luzhuoquan, so both parties were more than happy to sign this agreement," said SIPA's GM Jerry Yang.

"In the future, the two companies will be cooperating very closely, and in depth, on molds and bottle production systems. We believe this marks a new chapter in our business relationship," Mr Wu the chairman of Luzhuoquan said. "The two sides will share resources and cooperate in various fields to promote mutual business benefits."

"Luzhuoquan and SIPA have already been on an extraordinary journey together, and the journey continues," mentioned by Mr Wu and Jerry Yang. "To cooperate and grow together has been the sincere wish of the two partners from the beginning. We will work closely and support each other to create a new chapter in our business."

At the signing ceremony, Luzhuoquan and SIPA also took the opportunity to discuss progress in the high-end mineral water market, application scenarios of the PET packaged water market, and the joint outlook. They talked about cooperation in market development, packaging development and mold development.

Luzhuoquan Mineral Water Co., Ltd. has a vision of bringing high-quality mineral water to a growing number of Chinese families. It is committed to improving health and overall quality of life to all of its consumers. Between 2017 and 2019, the company obtained certificates for “China’s high-quality mineral water source” and “5A-level Chinese high-quality natural mineral water,” by China Nature Mineral Water Union (CNMWU) and passed the “Excellent Quality” rating by Test-it™ Hong kong.

The company continues to develop innovative products, opening new ways of providing mineral water, and promoting the upgrading of the Chinese mineral water industry. It is committed to leading the sustainable development of the company’s high-end mineral water sector.

With 30 years of experience in PET containers solutions, SIPA has acquired considerable expertise in bottle manufacturing and filling technologies, from preforms to finished products, for the food and beverage, chemical products, cosmetics, detergents and pharmaceutical sectors. Its extensive product range includes equipment for production of preforms as well as single-stage injection-stretch-blow moulding systems and stretch blow moulding equipment (both rotary and linear), filling monoblocs, process equipment and a full range of robotised and palletising solutions. It is a pioneer in PET light-weighting and novel bottle design.

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sodastream®

ISRAEL

SODASTREAM COLLABORATES WITH PTI AND SIPA TO PRODUCE NEW GENERATION TRITAN™ BOTTLES

SodaStream, a leading manufacturer of in-home carbonations systems, is known for marketing products which transform tap water into flavored or unflavored sparkling soda water at the touch of a button. In fact, the lifestyle enhancement company believes that “Planet Earth needs less waste and more sparkle.”
However, global success was not enough for SodaStream. The company knew it had to continue evolving to satisfy changing consumer needs. One of those needs was providing consumers with a sturdy, refillable container that would handle high dishwasher temperatures and accommodate high-pressure filling, as well as offer clarity and dent/scratch resistance.
Several years ago, SodaStream turned to PTI to assist them in engineering a solution that would delight its customers.

PARTNERING WITH PTI TO DEVELOP THE PREFORM

The process began with SodaStream working directly with Eastman Chemical to identify a Tritan™ resin grade that would deliver the necessary properties. It was important that the resin have amorphous glass-like clarity without crystallinity and haze.
The resin also had to show some strain-induced crystallization to accommodate reheat stretch blow molding.
The next part of the of the process was figuring out how to develop a preform that could be commercially blow molded. It was important to understand how the Tritan™ grade was going to be reheated because it needed to be approximately 30C hotter than PET to make the plastic preform malleable enough for blow molding.
That’s when the company approached PTI to assist them in developing the right preform.
After performing multiple blow molding and performance simulations, PTI determined that an 83g Tritan™ preform would be able to deliver optimum performance. This represented a 15% weight reduction from SodaStream’s existing 1L PET container. (Part of the weight savings is attributed to Tritan™ ’s lower specific gravity.)
Prototyping trials and performance evaluations were conducted to ensure application pressure safety, and a sidewall thickness of a minimum 0.7mm which was required for package integrity after being subject to multiple pressurization cycles. The Tritan™ material required higher stretch ratios and reheat temperatures compared to PET, which proved challenging for injection and reheat cycle times.

SIPA ADDS CUSTOM BOTTLE MANUFACTURING SOLUTION

The thick-walled plastic container meant challenges in both injection and blow molding. In order to blow mold a blemish-free container, special care has to be taken during the manufacturing process so that preform scuffing is minimized when the preforms are transported from injection to blow molding.
SIPA was able to engineer a blow molding machine with enough lamp power to heat a very thick preform close to 140C without having to carry over the heat of injection for blow molding.
This also eliminates scrap that had been generated when the blow molding line went down inadvertently. (Hundreds of preforms had been rendered useless each time because they could not be reheated back to the desired blow temperature).

The production process is composed by 3 steps, perfectly engineered to work synchronized as one.

PREFORM MANUFACTURING

The system that SIPA developed starts with an XFORM 350/48 Gen4 preform injection molding unit. This can produce several different types of preform both in PET and in Tritan™ .

Once molded on the XFORM, preforms are automatically taken out by a robot fitted with a “cool pick plate” and transferred to a stabilization station, where they remain for several cycles.

PREFORM TRANSFER

They are then picked up by a second robot, a six-axis anthropomorphic type fitted with special end-of-arm tooling equipped with vacuum suction, and immediately transferred to a SIPA SFL 6/6 EVO linear stretch-blow molding machine.

BOTTLE BLOWING

Here, the bottles are formed 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.

The knowledge and expertise that SIPA and PTI have under one global roof and the high level of flexibility provided were key factor for the success of this unique solution. The complete system involves a high degree of technical complexity that goes well beyond what is normal in the many systems SIPA and PTI have developed over many years for production of single-use PET bottles.

“The knowledge and expertise that SIPA and PTI have under one global roof and the high level of flexibility provided were key factor for the success of this unique solution.”

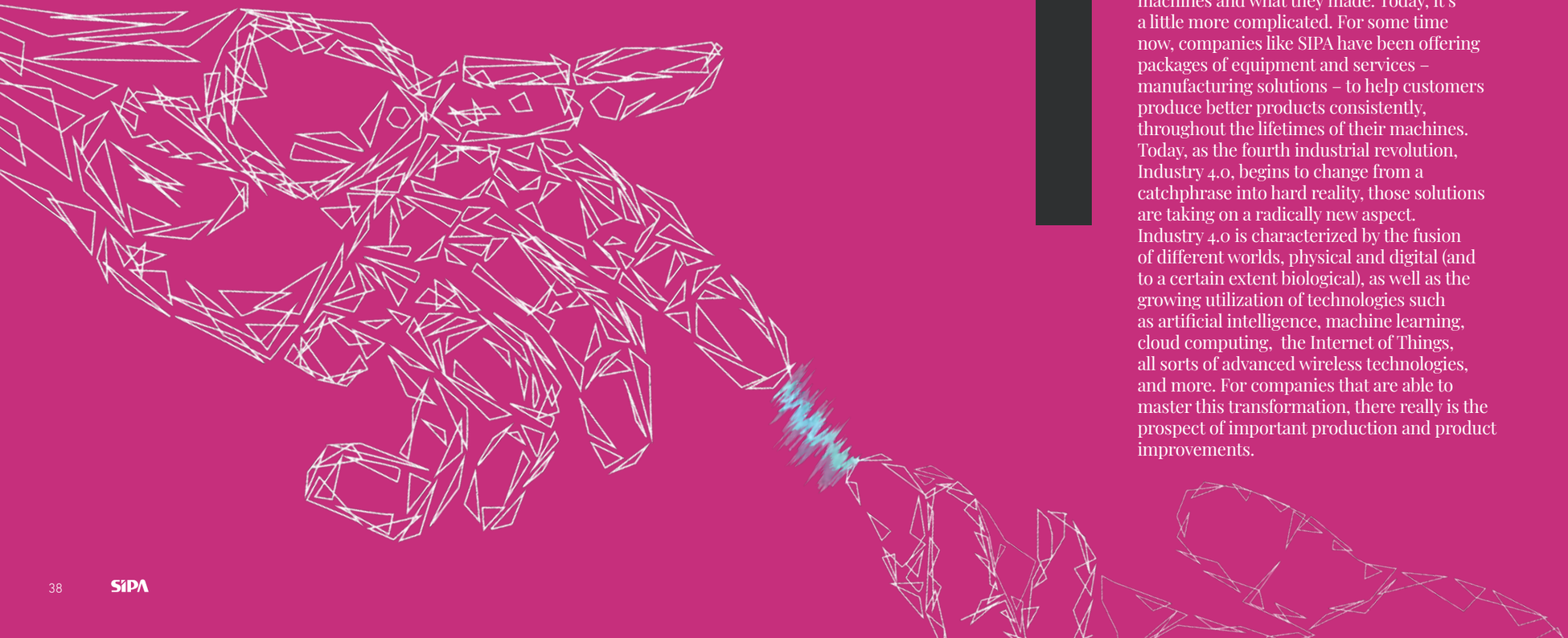
FOCUS ON:
digital transformation

02

ECHO
DIGITAL ECOSYSTEM

EASY, CONNECTED, HUMAN, OPEN

ECHO SYSTEM IS THE NEXT STEP IN THE DIGITAL TRANSFORMATION

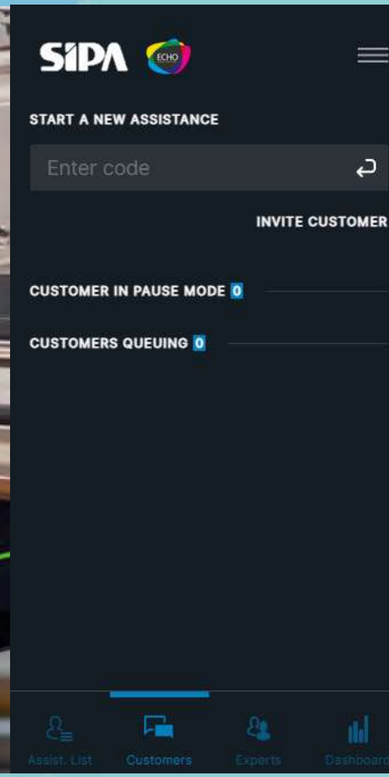


Manufacturing once used to be all about machines and what they made. Today, it's a little more complicated. For some time now, companies like SIPA have been offering packages of equipment and services – manufacturing solutions – to help customers produce better products consistently, throughout the lifetimes of their machines. Today, as the fourth industrial revolution, Industry 4.0, begins to change from a catchphrase into hard reality, those solutions are taking on a radically new aspect.
Industry 4.0 is characterized by the fusion of different worlds, physical and digital (and to a certain extent biological), as well as the growing utilization of technologies such as artificial intelligence, machine learning, cloud computing, the Internet of Things, all sorts of advanced wireless technologies, and more. For companies that are able to master this transformation, there really is the prospect of important production and product improvements.

LOOKING AFTER FINE DETAILS

SIPA's ECHO platform is a child of Industry 4.0. It was conceived to help customers transform their operations in the digital age and help them concentrate more on aspects of what they make – product quality, quantity, costs, and so on – while it takes care of the fine details of how it is made.
And like a child, ECHO continues to grow. At the core of this innovative digital ecosystem is a way to remotely monitor the operation of a SIPA machine in real time; but is far more than that. It is a complete assistance package, where the customer can find everything they need to keep their machines running in an optimal condition, without having a SIPA technician constantly on call: preventative maintenance details, machine software updates, training manuals, details of orders place and offers made, spare parts, and more. All together in one centralized platform.

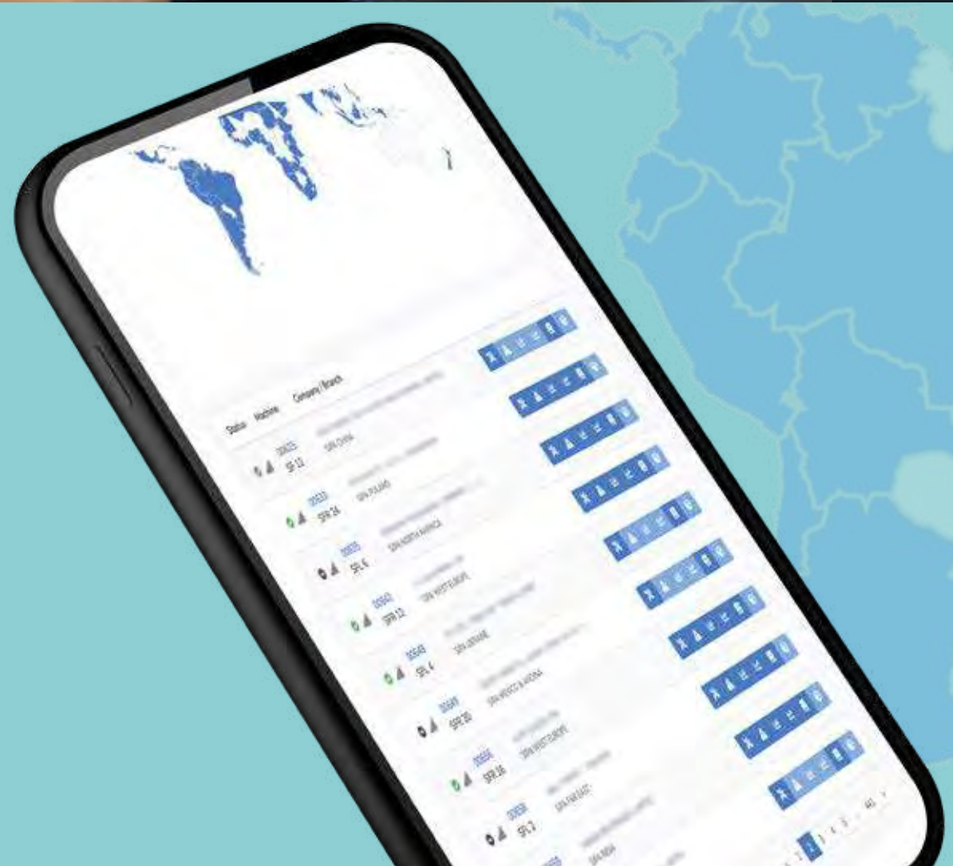
ECHO IS GROWING AND MATURING



SIPA introduced this revolutionary digital ecosystem at Drinktec some years ago, describing it as accessible, interactive, hyper-connected. Since then, thanks to technology advances and customer feedback, it has developed and matured. The concept is a clear one: to help PET container producers make their way safely, surely, and confidently, through the fourth industrial revolution. ECHO connects individuals, businesses, suppliers, and customers to bring value to players all along the supply chain.
"ECHO is truly innovative," says Roberto Ghirardo – Sales Manager Digital Products and Services at SIPA. "It promotes the growth and development of our industry through the active participation of professionals from a perspective inspired by total transparency, accessibility and usability. We live in a world full of data, information, and knowledge. Echo makes it possible for our partners to systemize and use all these elements in a lean way, and to create more value."

SMART TELESERVICE

Here is an example of what ECHO can do: through a smart Teleservice feature, remote SIPA technicians can accompany the customer's local technicians on the shopfloor with guided operations through a connection via mobile or wearable device. The local technician uses the camera on his device to frame the area of the machine they need help with, and the remote SIPA technician shows in real time what they need to do (see photo).

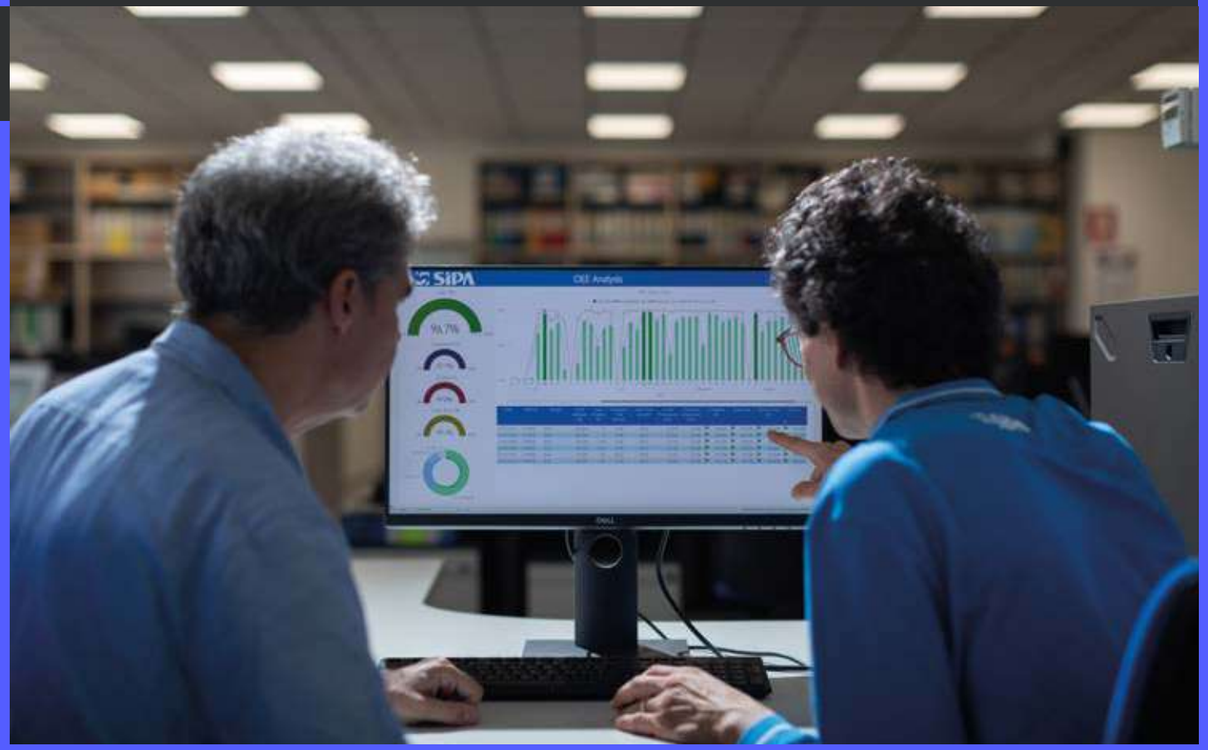


COMPREHENSIVE LINE MONITORING

ECHO can be powered by XDATA, which lets the customer monitor an entire line comprising not only the SIPA machines but also those of other suppliers. This is possible because it enables communications between systems from various providers.
Several solutions are already available today and more are in the pipeline. Here is a summary of those currently installed:

- Teleservice, a remote assistance with that provides troubleshooting and includes Augmented Reality;
- Smart Monitoring of production data and performance, powered by data driven business analytics;
- Xdata and Xchange IIoT packages, which collect, export and analyze sensors from all installations to enable analysis and data-driven evaluation of plant efficiency, with optimization suggestions;
- Warehouse 4.0, enabling customer operators to easily register all stock movements using a barcode scanner connected to the cloud.

Xdata, for example, includes such features as an overview of all machines, process values, analysis of production KPIs, Statistical Process Control, alarm statistics, event history and trends. Integration to the cloud is optional.



CYBER SECURITY IS CRITICAL

"A top priority for any digital solution, however, is the security of connection," says Lorenzo Guazzelli – Digital Innovation Manager. "To ensure this, a new SIPA infrastructure will replace any obsolete point-to-point S-connection previously adopted."
The core network is now based on a pair of PaloAlto Firewalls located in a powerful data center. This can establish IPSec VPN tunnels with the latest and certified security standards, implementing Threat Prevention, Intrusion Prevention, Antimalware, Application Visibility and URL filtering services.
All the connections and data transfer use the same secure VPN tunnel, established with the XCON device, that ensure further firewalling and IP network address translation ("natting"). In this way, it is possible to manage connections and authorize each technician to reach only the machines of his competence, and all the traffic is logged and easy to consult.

TECHNICAL WINDOW:
latest developments.

03

SIPA DEBUTS PREFORM MOLD WITH 200 CAVITIES

Not long ago, SIPA broke through a barrier of multi-cavity PET preform production with the first mold in the world to hold 180 cavities. The mold was the same size as one with 144 cavities, but advanced hot runner technology allowed SIPA to insert an extra 36 cavities; that's an almost incredible 25% more.
Well, SIPA has just gone and broken its own record. It has now made a mold containing no fewer than 200 cavities for preforms with necks up to 28 mm, typical for mineral water and beverage bottles. The mold still has the same external dimensions, so it can be mounted on an XFORM 500 GEN4 injection molding machine.
This 200-cavity mold makes it possible to produce over 140,000 preforms every hour, making the investment in an XFORM 500 production system even more cost-effective than ever. It is just what major packaging companies are after: with a single system producing more preforms, they can cut consumption of utilities, be more efficient in the use of labor, and tie up less valuable floor space. They can also maximize the potential for packaging line integration. One preform production system with a 200-cavity mold could be used to provide input for two bottle production and filling lines running at 81.000 bph.

“SIPA developed the 200-cavity mold using the principles that applied to the 180-cavity mold making no compromises on quality and reliability.”

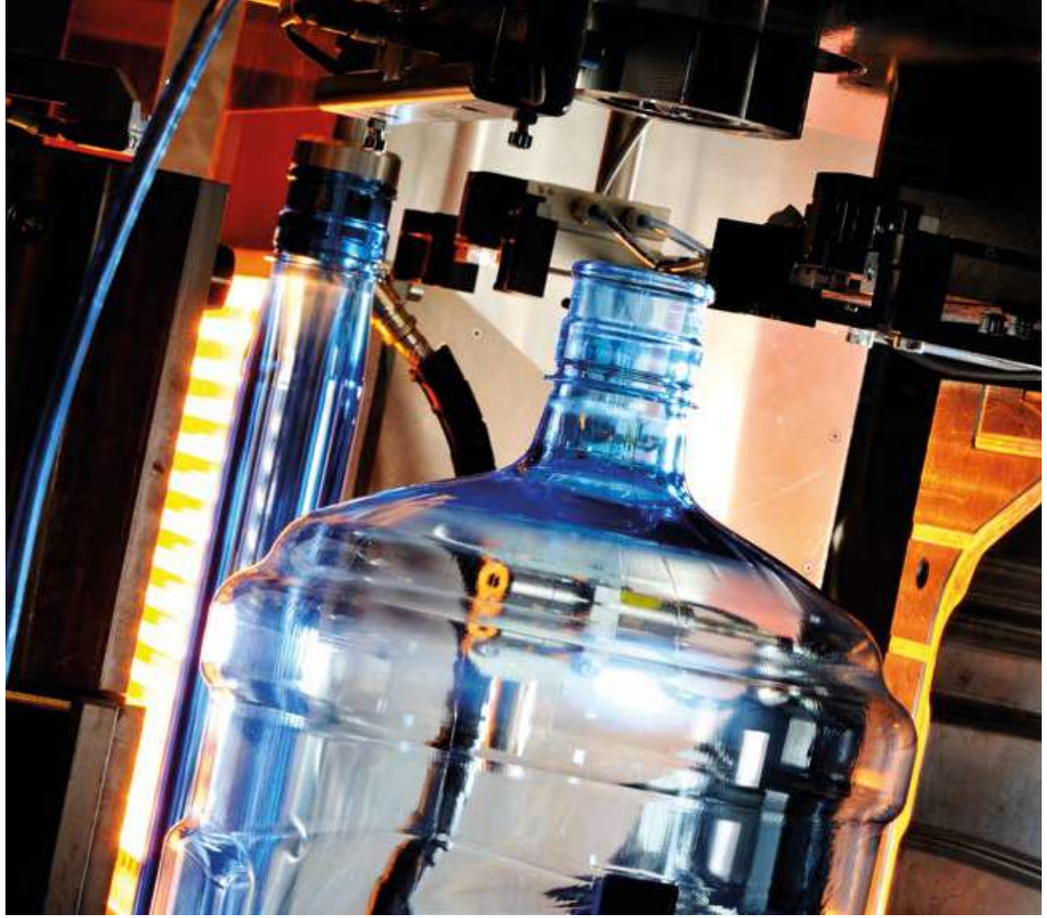
SIPA Preform Tooling Manager comments:
“We have the ability to create extremely well-balanced hot runner systems that are virtually unconfined by limits on geometry. SIPA's GEN4 hot runner design concept provides best-in-class balance, long maintenance intervals, and excellent ease of access when intervention is finally required.
“By increasing output on a 500-tonne machine without making it run faster – rather than running a mold with fewer cavities and shorter cycle times to achieve similar output, but putting extra stress on the machine – we can help the processor prolong equipment lifetimes.”

SFL

LARGE-FORMAT BOTTLE BLOWER SHOWS ITS ADAPTABILITY

“SIPA has come to the aid of a water bottling company looking for a single system to make big bottles in different sizes.”

The customer is one of a growing number of companies taking a shine to SIPA’s linear SFL 2/2 twin-cavity system. That’s because not only is it very good at stretch-blowing big PET bottles, but also because it can be quickly and easily converted from making one size to another, minimizing valuable downtime. This trend is particularly marked in South America, where large PET bottles are particularly popular for drinking water. In this case, the bottling company, located in Chile, wanted to make PET bottles sized 6.5 liters and 5 gallons (almost 19 liters). The 6.5-L bottles are single-use types, while the 5-gal bottles are returnable. It had been using polycarbonate bottles in these sizes – buying in the bigger ones and blowing the smaller ones on an old machine in-house -- but it decided to switch to PET, and bring all production in-house.



The new set-up allows the company to run the SFL 2/2 on-line and off-line, so that it can match the speed of its filling line with the speed of bottles coming in. The 5-gall bottles are produced off-line, enabling the company to build up a stock, integrating bottles blown in-house with others coming back from the market after use, before it starts to fill them on the filling line. Then, when it wants to produce and fill 6.5-L bottles, it switches to in-line blowing and filling.

The SIPA system is now producing up to 500 5-gal bottles per hour, each weighing 680g, and with a 55-mm neck. When producing the 6.5-L bottles, weighing 85g and with 48-mm necks, output is close to 1500 bottles per hour. Format changes are fast on the SFL 2/2, partly because the unit has a twin system for unscrambling and loading preforms, according to their size: one that orients the preforms using a roller (for standard preforms), and one that uses a robotic manipulator (for special preforms with body diameters larger than the support ring diameter) . Only a few components actually need to be changed: star wheel, plates, preform guides, and that's it. Two operators working together can have the system back up and running inside 50 minutes.

For customers wanting to blow even bigger PET bottles, SIPA also offers the SFL 1 XL. This can produce containers anywhere from 15 to 30 liters in size, and answers calls from the market for low unit costs. The SFL 1 XL is ideal for production of returnable containers at a rate of around 250-300 units per hour, or as many as 700 stackable/one-way containers in the same period.

SIPA SYSTEMS FOR WINE BOTTLING AND PACKAGING

Some of the best wine makers in the world rely on SIPA to fill and pack their bottles. For people who know SIPA as a leader in PET bottle design and production technologies, that may come as something of a surprise. But for some 13 years now, since parent company Zoppas Industries bought the Berchi Group in 2008, SIPA has specialized in the development, production and delivery of complete bottling and packaging lines for glass bottles as well as PET – and that includes wine bottles.
Famous names that include leading prosecco producer La Marca and Marchesi Antinori – use SIPA equipment to help ensure their wines reach the customer in prime condition. In fact, SIPA has wine-making customers across Europe, North and South America, Asia, South Africa, and Australia.

SIPA CAN DESIGN AND TEST PET BOTTLES FOR WINE

PET bottles for wine are increasing in popularity especially in some countries/ regions and for some reasons related to safety (special events, in airplanes, etc). They can indeed offer other advantages beside infrangibility: they are lighter compared to glass ones (think of transportation), they can be resealable and produce less CO_2 during they production and recyclable.
Along the years, SIPA designers made efforts to design bottles with glass like appearance and classic wine bottle shapes: Burgundy, Bordeaux, Riesling and Champagne shape.
SIPA's laboratory made several tests with PET barrier additives as all wines, reds and whites, are sensitive to oxygen and light which can produce several chemical reactions causing alteration of taste and color.

> **"Barrier additives are also added in order to guarantee a good enough barrier for at least 12-24 months of shelf-life."**

BOTTLE PRODUCTION

All SIPA's systems for the production of containers are basically suitable for the production of PET bottles for wine: for small to medium production outputs with blended PET bottles a single stage ECS SP can be used. For larger size bottles, multilayer and blended preforms the best option is linear blowmolder SFL EVO. When the need is for higher outputs, XTRA rotary blowing system is the choice.

MULTIPLE CHOICE IN DEPALLETIZING

SIPA offers different types of depalletizer, for example, starting with the Genius DS fully automatic steady-pallet unit, running at 180 layers per hour, through to the Genius DC/A fully automatic moving-pallet unit, running at 300 layers per hour.

MAKING AND FILLING CARTONS

When it comes to cartoning solutions, SIPA is possibly the only supplier in a position to satisfy all customer requirements. In the Formex range of carton erectors, different models run at rates of up to 50 cartons per minute. For putting bottles in the cartons, SIPA offers the Jolly single-head and Silent multi-head conventional case packers, typically used for American-type cartons; depending on the version, these operate at up to 3800 cycles per hour.
For customers wanting more specialized packing solutions, four- or six-axis Robby Pack robotic systems provide very high levels of customization; with its anthropomorphic gripping heads, the robot can carton flat-wise bottles, crosswise or upside-down way, with or without the partitions insertion device.

Robby Pack can handle complex manipulations, whatever the size of the bottle size, whatever the production output – all the way up to 40,000 bottles per hour.

INNOVATION IN PARTITIONS

Uniwrap, meanwhile, is a packer for wrap-around cartons, available with or without partitions inserter. Uniwrap, with its modular design, can handle a wide range of sizes and speeds, from 25 to 55 cases per minute.

Uniwrap allows rapid format changes, without requiring tools or additional equipment.
This technology can be integrated with a supplementary device, perfectly integrated with the machine, that makes Uniwrap the first system in the world to feature a pre-fitted stretched honeycomb cardboard inserter. This has numerous advantages, not the least being that honeycomb partitions can cost 30% less than corrugated cardboard.

GLUE OR TAPE

When cartons need sealing, SIPA provides options here too: systems that work with hot-melt adhesives to seal upper and lower flaps and handle the fastest lines running at up to 2500 cartons per hour; and also systems using adhesive tape for speeds of up to 1200 cartons per hour.

PUTTING PACKS ON PALLETS

Palletizing solutions from SIPA include the conventional Genius PTF steady-pallet unit and the Robby PAL robotic palletizer. Genius PTF uses low-level feeding and includes a halving platform for layer transferring. Plus, it incorporates an innovative row preparation system (Active layer) designed to optimize medium- and low-speed palletization plants. It is composed of a clamp-type head (patented by SIPA) installed on linear axes, that can handle up to six packs at the same time and guaranteeing very fast, accurate and soft pack rotation. Robby PAL is very flexible handling several type of container and serve multiple lines at the same time, it easily adapts to extremely reduced footprint areas. SIPA offers numerous options for the gripping heads.

WRAPPING AND DECANTING OPTIONS

> For pallet stretch-wrapping, once again, SIPA provides several options: the SPM rotating-platform type, which can wrap up to 40 pallets per hour; the SPF rotating-arm type (70 pph), and the SPF/A rotary ring type.

Finally, the decanting system in case there's the need to store wine bottles in the cellar for aging, and then put them back in line for the final packaging before shipping to the market. Solutions can be customized to crate into and decrate from special metal or wooden crates. SIPA systems can handle all sorts of bottle configurations, with bottles laid horizontally or vertically, with output speeds from 2000 to 24,000 bottles/hour.

TURNKEY SYSTEMS

It goes almost without saying that SIPA supplies not only individual elements of a wine bottling and packaging line, but also complete integrated lines, designed and built to individual customer requirements. If and when there is a need in such lines to incorporated equipment built by third parties, SIPA's engineering and quality departments are engaged in ongoing market scouting to discover the best and most advanced application technologies, qualification of suppliers in terms of business characteristics and technical solutions, and the creation of long-term partnerships for provision of the most-required equipment.

SIPA XTRA is extra speedy

When SIPA unveiled its ground-breaking XTRA rotary stretch-blow molding system at Drinktec 2017, it immediately stood out from the pack, not only with its energy efficiency and its versatility, but with its speed. The company claimed at the time that XTRA, with its extra-wide process angle, could produce 2550 high-quality 1.5-liter CSD bottles per cavity every hour, easily Best In Class. That took some believing.
Well, it turns out that SIPA was not exaggerating. Quite the opposite in fact. Today, at customers, in commercial use, XTRA is running even faster. It is regularly hitting a record rate of 2700 bottles/hour/cavity.

ALL OVER THE WORLD

Not surprisingly, those customers are rather pleased, to say the least. Which is why they are coming back for more, with several repeat orders already having been placed. XTRA equipment is now operating all around the world, in Europe, North and South America, Asia-Pacific, Middle-East and Africa.
XTRA systems are suitable for production of cold- and hot-fill bottles, in virgin or recycled PET. The largest can produce a total of 65,000 bottles per hour. In production of hot-fill containers, XTRA machines can run at 2000 units per cavity per hour (0.5 L). Seven versions are currently available, holding between six and 24 molds.

COST CUTTER

The new models combine features to maximize performance while cutting Total Cost of Ownership (TCO) by a full quarter. The 200-degree ACTIVE angle is larger than on any other machine – 15% wider than the market standard – energy consumption is around 25% less, high flexibility is demonstrated by the fact that any one machine can produce top-quality containers in sizes from 0.1 to 3.5 liters, ease of use is outstanding, and XTRA is highly compatible with other machines upstream and downstream.
“XTRA is further proof that SIPA provides the benchmark in technologies for the production, filling and packaging of PET containers,” says Paolo De Nardi, SIPA’s Product Manager for stretch-blow molding machines.

A PERFECT COMBINATION OF SPEED AND QUALITY

The high output figure is the result of an R&D process involving SIPA’s entire development department that put particular emphasis on kinematics and mechanical movements. It makes it possible to reduce the number of blow molds for any given total output requirement, accelerating changeover times and lowering investment costs.
The wide process angle on all XTRAs facilitates production of bottles of excellent quality, even at high speeds. It makes it possible to apply high pressure air for up to 0.8 seconds at max speed, enabling production of containers, even the most complex ones, with extreme accuracy.

FOR MANY PRODUCT TYPES

Each XTRA can not only produce a wide range of bottle sizes, it can also accommodate different neck sizes (28/38 mm). In addition, the clamp stroke has three settings: short, to produce bottles of up to 0.7 L at a maximum speed of 2700 bhc; and Medium for container up to 1.5L; and then Large, for containers up to 3 L and an output of up to 2400 bhc. This mechanical flexibility is complemented by the ability of the machine to produce hot- and cold-fill containers without any changes needing to be made to the system. In this way the machine is tailored for specific project, but it’s also ready to evolve, adapt, and match the future challenges and opportunities.
As well the recent introduction of Preferential Heating, an option to produce high-quality oval and rectangular bottles. This great feature is derived from the best-in-class SFL platform, used worldwide to produce complex containers on personal care and home care, to mention a few.

A SYSTEM THAT IS OPEN AND COMPATIBLE

XTRA was designed to be able to integrate and interact with other machines, creating high-performance production systems consisting of different products that all speak the same language. It can for example be directly connected to a filler to create a standard system for production and filling of PET containers; equally, it can be integrated with SIPA’s XTREME rotary injection-compression platform for preform production. Finally, XTRA can interface with XTREME Renew, which produces preforms directly from recycled bottles, creating a system unique in the world – XTREME Renew Sincro.

INTUITIVE, ACCESSIBLE, AND RESOURCE-EFFICIENT

XTRA is fast and flexible, and it is also easy to use. Thanks to its simple interface, each user can adjust all parameters extremely quickly and safely. In addition, all planned and assisted maintenance activities can be carried out without the use of tools for either quick mold change or neck changing. Mold change is very appreciated by our customers, enjoying the 30seconds mold change, without tools, without energy, no risk, no problems.
Finally, XTRA makes it possible to reduce operating costs while maintaining a high performance level. Its ovens are designed for outstanding energy saving, even during extremely complex processes. The new blowing unit guarantees the least possible dead volume, while the air recovery system during the pre- and post-blowing phase results in optimal use of the air required for processing.

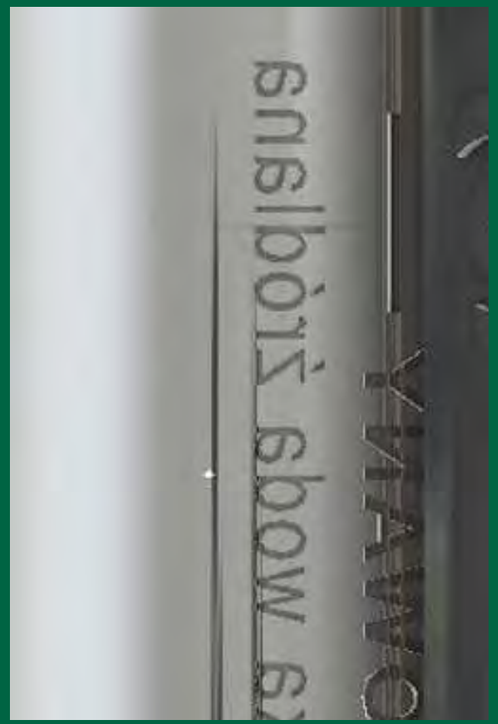
PETWORK:

concept, design, engineering,
what's new in packaging world

04

THINK LABEL _FREE

Bottle recycling is a growing business, so any development in bottle design that helps cut the cost of the process is welcome. One element that can add to overall recycling costs is the label. Labels for PET bottles can be made in paper or in plastic, and they can be attached with glue or by shrink wrapping. But in all cases, they need to be removed from the bottle during washing and sorting, so that the PET can achieve a purity that enables it to be profitably recycled into a new bottle.



Removing labels from used bottles is costly for the recycler – not very costly, but costly all the same – and so of course for the packaging company is the process of producing the labels in the first place, warehousing and handling them, and then attaching them to the bottles. So why not eliminate all these costs by not using labels at all on PET bottles?

Food and beverage giant Danone thought it was worth a try. Which is why it teamed up with SIPA to develop and produce label-free bottles for spring water in Poland, Żywiec Zdrój. SIPA was responsible for development during the engineering phase of the package, for all the prototyping, and for production of very special molds for the SIPA's 12 cavities stretch-blow molding platform used by Danone.

A limited-edition 400-mL bottle for Żywiec Zdrój still water has come onto the market in April 2021. It is a triumph of bottle design and production engineering.

The development of this highly eco-friendly rPET bottle presented a formidable challenge for SIPA, since the information and decoration normally found on the label had to be integrated into the body of the bottle. In addition, the bottle shape and size were conceived to save as much possible on the pallet in order to save transport and handling costs. Furthermore, the bottle is made from 100 percent post-consumer PET, as well as being highly recyclable.

The surfaces of the mold cavities created by SIPA incorporate a combination of embossments and debossments – raised and recessed designs – that are mirrored in the surface of the finished bottles. The extreme quality of the molds, together with the precision in the blow molding process, is a precondition for obtaining detail on the bottle that is attractive and – for the lettering – legible.

"Considerable work during prototyping went into ensuring the visibility of the logos," says SIPA's Packaging development Manager. "This is not only necessary from an aesthetics point of view, but also because the law requires that information relating to water quality is clearly visible on the bottle."

As for the customer, Danone's Żywiec Zdrój brand manager Maria Uszyńska says: "We are glad to present the first bottle on the Poland market without a label and made of 100% recycled plastic. This is another step of our company towards closing the plastic cycle."

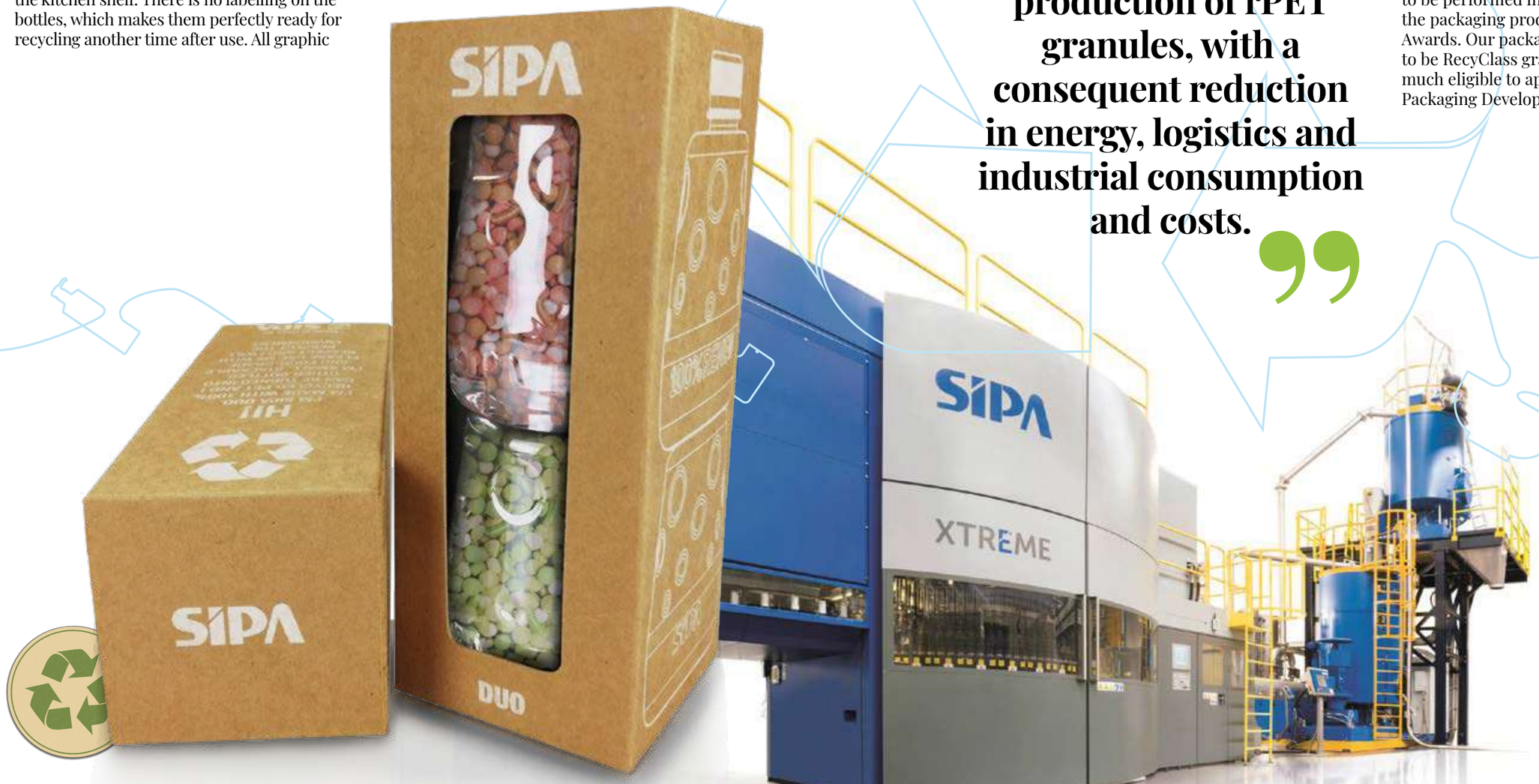
SIPA'S DUO MINI STACKABLE

under the spotlight

SIPA Duo Mini Stackable, SIPA's innovative and sustainable concept for packaging dry foods, was shortlisted for two different sustainability awards this year: the Italian Best Packaging Awards from the Italian Packaging Institute and the Plastics Recycling Awards Europe 2021 in Amsterdam where it was among the worldwide finalist for best and more sustainable packaging.
SIPA conceived the Duo Mini Stackable for packaging spices, nuts, dried fruits, pulses and the like. The two identical containers have bases with accentuated hollows, reminiscent of those in wine bottles, so that one can fit snuggly on top of another in a compact arrangement in the box, and then later on the kitchen shelf. There is no labelling on the bottles, which makes them perfectly ready for recycling another time after use. All graphic communication is printed directly on the cardboard of the secondary packaging, which is assembled without the use of adhesives – again facilitating recycling. SIPA Duo Mini Stackable shows off in the best way how small, beautifully designed plastic bottles can be highly sustainable. Two stackable bottles produced in 100% post-consumer PET using XTREME Renew, the highly innovative technology developed by SIPA in collaboration with Austrian recycling technology specialist Erema, are packed in personalized boxes made from 100% recycled cardboard.

“XTREME Renew technology makes it possible to produce preforms directly from PET flakes, thus avoiding all the steps related to the production of rPET granules, with a consequent reduction in energy, logistics and industrial consumption and costs.”

To ensure full compliance with contact with food, before extrusion, PET flakes are subjected to washing / decontamination using the Erema's Vacurema system. SIPA's XTREME extrusion-injection-compression molding technology allows a weight reduction of around 10% compared with regular injection molding technology (each container weighs just 7.6g), while the use of 100% rPET cuts CO_2 emissions by 80% compared with production using virgin PET.
“It is for us extremely significant to get various recognitions for this packaging that is a concentrate of innovation and technology. It is also important to mention that RecyClass analysis had to be performed in order to submit the packaging product to the PRSE Awards. Our packaging resulted to be RecyClass grade A so very much eligible to apply,” said Sipa's Packaging Development Manager.



HARTWALL

FINLAND

SIPA HELPS OUT HARTWALL WITH REBRANDING FOR FINLAND'S TOP-SELLING MINERAL WATER

Long-time SIPA customer Hartwall in Finland has once again hit the spot with two new shapely bottles for its best-selling Novelle mineral water.

The bottles, one 500-mL and the other 1500-mL, have an enticing twisting look that cries out to be picked up and held.
SIPA helped out Hartwall with the design and engineering of the new bottles, which are already turning heads in Finnish shops. Both formats, used for sparkling, and flavoured mineral water, were successfully tested in SIPA's prototyping laboratory in Italy. SIPA also supplied a full set of molds for use on SFR24 rotary stretch-blow molding equipment used by Hartwall.
Hartwall Novelle is the most popular mineral water in Finland. The water, which comes up from the own well, is filtered through ancient Finnish gravel ridges for a pure and natural drink. The new designs are sure to strengthen the brand's differentiation in the category. Hartwall says the rebranding was carried out to bring a new focus on the beverage line's quality, freshness, and purity, and position it as Finland's most iconic and tastiest beverage.

SUSTAINABILITY

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

05

TAKING A HOLISTIC APPROACH TO PET PACKAGING WITH AWArPET

SIPA's philosophy for PET containers is a holistic one – it looks at the big picture of how low-weight, high-performance, aesthetically pleasing, consumer-friendly PET packaging fits best into the new circular economy.

SIPA is among the global elite of suppliers of equipment systems for producing (and filling) PET preforms and large and small containers. This offering is backed up by a comprehensive design service that helps customers take early ideas about containers all the way through drawings, virtual and real prototypes – functional as well as decorative – testing and validation, through to the definite article. We are strongly focused on optimizing the use of PET in liquid packaging," says Sipa's Packaging Development Manager. "We identify and implement the proper lightweight solution, based on customer and market demands, transport and handling logistics, local scenarios, and other influencing factors. Secondary packaging may also play a part. It almost goes without saying that SIPA is a strong advocate of the use of post-consumer recycled materials."

DESIGN, ENGINEERING, AND PRODUCTION WITH 100% rPET

PET bottles containing post-consumer recycled material – rPET – have in a relatively short time become a common sight, rather than the exception that they were just a few years ago; use of rPET is destined to increase further, with a growing number of bottles made in 100% rPET. SIPA has built up considerable experience through its expertise in bottle design and in process technologies to enable the use of rPET. This means not only creating designs that take into account differences and variations in processing characteristics of rPET, but also other less obvious factors such as the increased level of powder that rPET processing creates (more on this later).
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 production and bottle blowing that is almost, if not exactly, the same as virgin PET.

A NEW BRAND - AWArPET

Sustainability has for many years been at the heart of SIPA thinking about everything it does, whether it is the way its equipment is built and works, or how its customers containers are produced, filled, used, disposed of, and, increasingly, recovered and converted back into containers again.
These days, SIPA's product design experts are involved in the development of 3000 or more new packaging designs every year. The three R – Reduce, Reuse, Recycle – are constant principles in all of these projects. SIPA has now established a new brand -AWArPET – which stands for an environmentally conscious approach to the design and production of PET packaging.

RECYCLASS RULES

SIPA strictly follows the Recyclass Design for Recycling guidelines established by EPBP, the European PET Bottle Platform. This voluntary industry initiative provides PET bottle design guidelines for recycling, evaluates PET bottle packaging solutions and technologies, and facilitates understanding of the effects of new PET bottle innovations on recycling processes. EPBP is supported by the European Federation of Bottled Waters (EFBW), the European Association of Plastic Recycling and Recovery Organizations (EPRO), Petcore Europe, Plastics Recyclers Europe (PRE) and European Soft Drinks Industry (UNESDA). It has established several test procedures in order to assess the impact on recycling of new packaging technologies. Products that pass the tests should not cause any problems during recycling.

THE GREEN PLASTIC FACTOR

AWArPET bottles are very light. SIPA has for example been involved in one design project, code-named Mario, for a one-liter water bottle weighing just 16g, far lighter than most 1-L bottles currently on the market. The company believes that over the next three-to-five years, the weight could come down even more. However, low weight is not a be-all and end-all. Consideration also needs to be given to the notion that a well-designed but heavier PET bottle, with a PET label, may actually in the end prove more sustainable than a lighter one that has a multilayer structure or a PVC label, both of which hinder recycling efforts.

SIPA uses something called the Green Plastic Factor to show how light a bottle is in comparison with what it holds. The Green Plastic Factor (or GPF) is the ratio of the volume of the container contents in mL to the weight of the unfilled container in g. For a collapsible 10-L bottle, the GPF is around 125, while for a single-serve 500-mL bottle it is around 55. This clearly shows the high level of sustainability of large-format bottles, production of which SIPA has developed specific equipment.

> **“For a returnable 2-L bottle, the GPF is also low, at around 20. But if such a bottle fulfils its purpose and makes multiple trips, it can be assigned a “virtual” GPF, which can be close to 200.”**

Green Plastic Factor is just one tool that SIPA uses in its design projects: it is a means rather than an end. So, for example, an ultra-light 5-L water bottle may have a high GPF – possibly around 85 – and also have very good performance as indicated by high top-load strength, but these have to be weighed against factors that are not so positive, such as the fact that it is single-use, and it requires the implementation of good logistics.

FROM FLAKE TO PREFORM IN A SINGLE STEP

One issue still in the balance is just how all those used PET bottles are converted back into new ones. Reducing them to flake, converting the flake into granules and then reprocessing the granules into preforms and then bottles is the obvious solution is the most obvious one – but it is not necessarily the most economic one. 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. XTREME Renew eliminates an entire section of the heat history of rPET, making it considerably more cost-effective than alternative systems, while also offering extra benefits in terms of carbon footprint. SIPA believes that for converters considering the use of high volumes of rPET, it is a highly attractive proposition.
At the same time, SIPA acknowledges that XTREME Renew does require investment in equipment that many converters are unfamiliar with. This is why it also supplies 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. SIPA has developed XActive-Cleaning, a patented system, which adapts the compressed air flows, normally used to move the hot runner valves stems, to also blow out the very few plastic particles that deposit inside the actuators each cycle.

> **“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.

PULLING A VACUUM DURING INJECTION

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. But the vents can become dirty if the air flowing through them is not completely clean – impeding the passage of the air. SIPA has patented a solution that pulls the air out of the mold during injection. Net result is that the need for operations to clean the vents is also drastically reduced.

ACCOUNTING FOR COLOR VARIATIONS IN rPET

Not all rPET preforms are the same. Because the raw material usually comes 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 and patented as X-Vents®, can be inserted into the bottle molds, making it possible to manage pressure changes in the cavities caused by the process adjustments relating to the different levels of energy absorption of the preforms.
SIPA's Product Manager for Blow molding Systems, says:

> **"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."**

He 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.

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