



ECS

Integrated Systems

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Zoppas Industries

Feel free to imagine. We make it happen.



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C03_r0_14

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ECS: the integrated system with the highest output in the market

With ECS integrated systems, all types of containers can be easily produced: standard, customized, heat set, ultra-clean and aseptic, ovals, and jar at high speed.

Packaging solutions

Extensive experience.
During the last 20 years, SIPA has gained an unmatched experience in the development and optimization of bottles and preforms and over these years it has engineered thousands of containers for a multitude of applications, from drinks to food, cosmetics, detergents and pharmaceutical products.
SIPA is able to support its customers by offering preform and container solutions which best suit the customer's specific needs, from the design and supply of samples up to quality certification. Sipa's Bottle Development Department is equipped with a multitude of single-stage and two-stage pilot machines and a laboratory for the quality certification of the products which is fully equipped to perform all the tests normally required on preforms and containers - including chemical and physical property tests (e.g. AA, gas permeability) - as well as filling simulations.

Complete solutions.
Over the years, SIPA has developed unique single-stage and two-stage technologies for a wide range of applications, implementing turn-key industrial systems and acquiring a thorough knowledge of production processes. The company is able to guarantee the functionality and optimization of the packaging as a whole: preform, container, closure, label, packaging and palletizing.
ECS: the most versatile systems in the market. SIPA has been designing and manufacturing integrated systems since 1986. The consolidated experience it has acquired and the high technological level it has reached make SIPA one of the world's leading companies in this sector. SIPA integrated systems, the ECS range, starts from the raw material, the resin, and takes the process through to the finished container

without any interruption, with total automated control of all phases of production. Costs associated to traditional two-step processes (such as preform handling, preform storage, preform cooling & reheating) are simply not part of the integrated process. These systems are extremely versatile and can produce a wide range of standard and customized, containers: lightweight bottles for standard or hot fill use, ultra clean or aseptic bottles, pasteurizable containers, warm filled bottles, wide mouth jars, round or square shaped bottles, oval, asymmetric or tailor-made containers. A comprehensive, competitive range that makes ECS machines a sure answer to a wide variety of requirements.

Containers

Materials:
PET, OPP, PEN, PLA,
Recycled PET, Regrind PET

- Type:**
- Lightweight, standard & tailor-made
 - Heat Set & pasteurizable
 - Aseptic & Ultra-Clean
 - Wide mouth
 - Oval & asymmetrical
 - Light barrier
 - Gas and oxygen barrier
 - Moisture barrier
 - Active packaging
 - Retortable



Applications



Non-carbonated water



Carbonated water



CSD



Fruit juices



Isotonic and Sport drinks



Functional drinks



Tea



Coffee



Milk and Milk-based products



Edible oils



Beer and spirits



Detergents



Personal care



Paste and semi-paste products



Dressings



Honey



Sauces



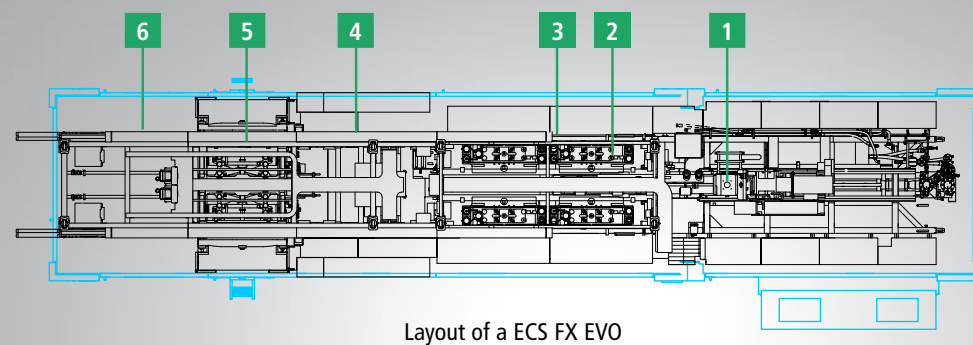
Dry products



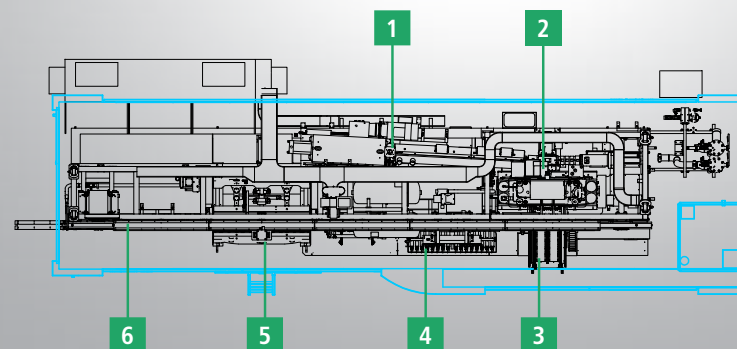
Innovative design for excellent performance

The ECS platform.

The ECS platform has been recently upgraded to the latest innovations. The ECS FX and HS represent the evolution of SIPA's market leading technology. SIPA's integrated system starts with the raw material and takes the process through to the finished container without any interruption, with total automated control of all phases of production. The closed loop control system, active in each individual phase of the machines' cycle and extended throughout the whole production cycle of the machine, makes SIPA's one-step process a closed, self-diagnostic system in which the parameters and changes in production are controlled rapidly and efficiently with immediate effect.



Layout of a ECS FX EVO



Layout of a ECS HS



1 Plastification.

Previously dehumidified PET granules are plasticized in the extruder using a screw specifically designed by SIPA. During the plasticization stage the material is melted, homogenized and slowly transported by the screw in order not to generate shear stress and consequently reduce the AA level and the IV drop to the minimum.



2 Preform injection.

The melted material is injected into the mold by means of an optimized injection profile aimed at obtaining high quality preforms. Preform production cycle time depends on the geometrical shape and weight of the preforms, which depends on the container to be produced.



3 Handling.

Once the injection cycle has been completed, the preforms are picked up by a transport system to the next process phase. During handling, the preforms are held by collets that keep them in the correct position by putting only a very slight pressure on the neck. To prevent the thermal profile from being altered there is no contact with metal parts.

The ECS range

The SIPA ECS integrated system is the fastest single-stage platform available, with output up to 600 BPM. ECS machines are extremely versatile systems. The integrated system ECS (FX model) can simultaneously produce different size and/or shape containers for 2 bottling lines feeding.

* Output rates are indicative and subject to confirmation by our technical dept. for any specific application.

Models	Cavities		Maximum size (l)	Max neck Ø mm	Output* (b/h)
	Injection	Blowing			
ECS FX 20/80 EVO	80	40	1.0	38	up to 36,000
ECS FX 20/64 EVO	64	32	2.0	45	up to 28,800
ECS FX 20/48 EVO	48	24	3.0	45	up to 21,600
ECS FX 20/48 EVO WM	48	24	3.0	73	up to 13,500
ECS FX 20/40 EVO WM	40	20	3.0	89	up to 11,250
ECS FX 20/32 EVO WM	32	16	3.0	90	up to 9,000
ECS HS12-150/40	40	20	1.0	30	up to 18,000
ECS HS12-150/32	32	16	2.0	32	up to 16,500
ECS HS12-150/24	24	12	3.0	38	up to 12,300
ECS HS12-150/16	16	8	7.0	48	up to 8,200
ECS HS12-250/40	40	20	1.0	38	up to 18,000
ECS HS12-250/32	32	16	2.0	43	up to 14,400
ECS HS12-250/24	24	12	3.0	53	up to 10,800
ECS HS12-250/20	20	10	7.0	58	up to 9,000



4 Thermal conditioning.

The conveyor system takes the preforms to the preform conditioning areas. These areas enable the ideal preform thermal profile for stretch-blowing phase. For different types of containers, different kinds of thermal treatment are available.



5 Stretch-blowing.

The conditioned preforms reach the stretching-blow molding section: all stretching rods blowing time parameters are electronically controlled. They are blown in two phases, one with low air pressure (approx 10 bars) and one with high air pressure (25 to 40 bars). The blow mold can be heated if production involves hot fill bottle production.



6 Bottle outfeed.

The conveyor system takes the finished containers to the outfeed section. Containers can be outfed using gravity onto flat conveyors and sent to storage silos or taken on air pressure conveyors directly to the filling lines. If only preforms are produced special systems for pick up, cooling and outfeeding are available.



The highest bottles quality at the lowest cost in the market

The ECS unique features translate into major advantages in term of cost savings, higher bottle quality and high production versatility.

Cost savings

The integrated process guarantees the very low production costs thanks to the following features:

- preforms are designed for immediate blowing allowing the highest bottle weigh reductions in the market;
- no external handling (preform handling, storage, conditioning): maximum cost reduction for logistic and manpower;
- no energy costs associated to preform cooling and subsequent reheating;
- ECS platform guarantees very low maintenance costs;
- the ECS platform can operate in tropical extreme environmental conditions without expensive conditioning systems.

Energy and compressed air saving

- The integration of injection and blowing process, with no need of cooling and re-heating the preforms, guarantees the lower energy costs per container produced (kW/bottle);
- better system efficiency thanks to the electric motor for extrusion and preform handling (no hydraulic motor);
- lower compressed air consumption due to "dead volumes" reduction;
- innovative and patented AIR recovery system (ARS) allows the recovery of high pressure air to be used for other process phases (air for service and blowing) and for others equipment.

Bottle quality

- The ECS integrated process allows producers to make dedicated preforms in order to obtain the optimum characteristics of thickness, diameter and height for the particular size and application of the finished container;
- extremely light containers can be produced for standard, hot fill or wide mouth applications;
- the integrated process controls the humidity levels from the granules to the preform to the stretch-blowing phase. The low level of humidity obtained results into a higher level of crystallinity in the container which means higher mechanical and heat resistance performance;
- the integrated process eliminates preform storage and handling. This enables excellent aesthetic appearance of the container produced with no scratches or blemishes;
- possibility of immediately correcting within the same machine (both in the injection and blowing phases) any defect found in the container (no risk of building large preform storage and discover later that the quality is low).

Clean containers

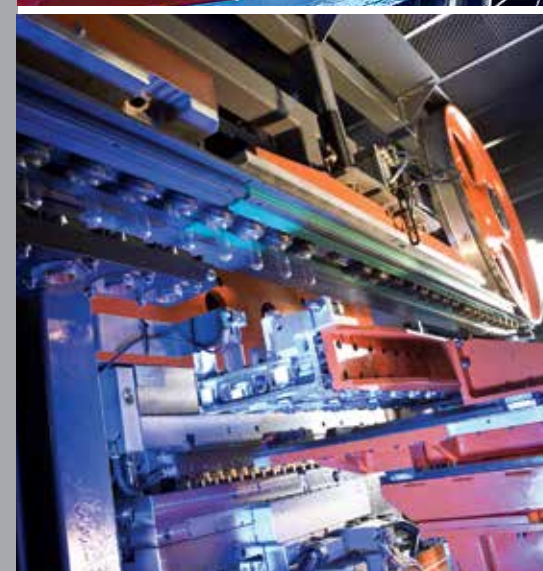
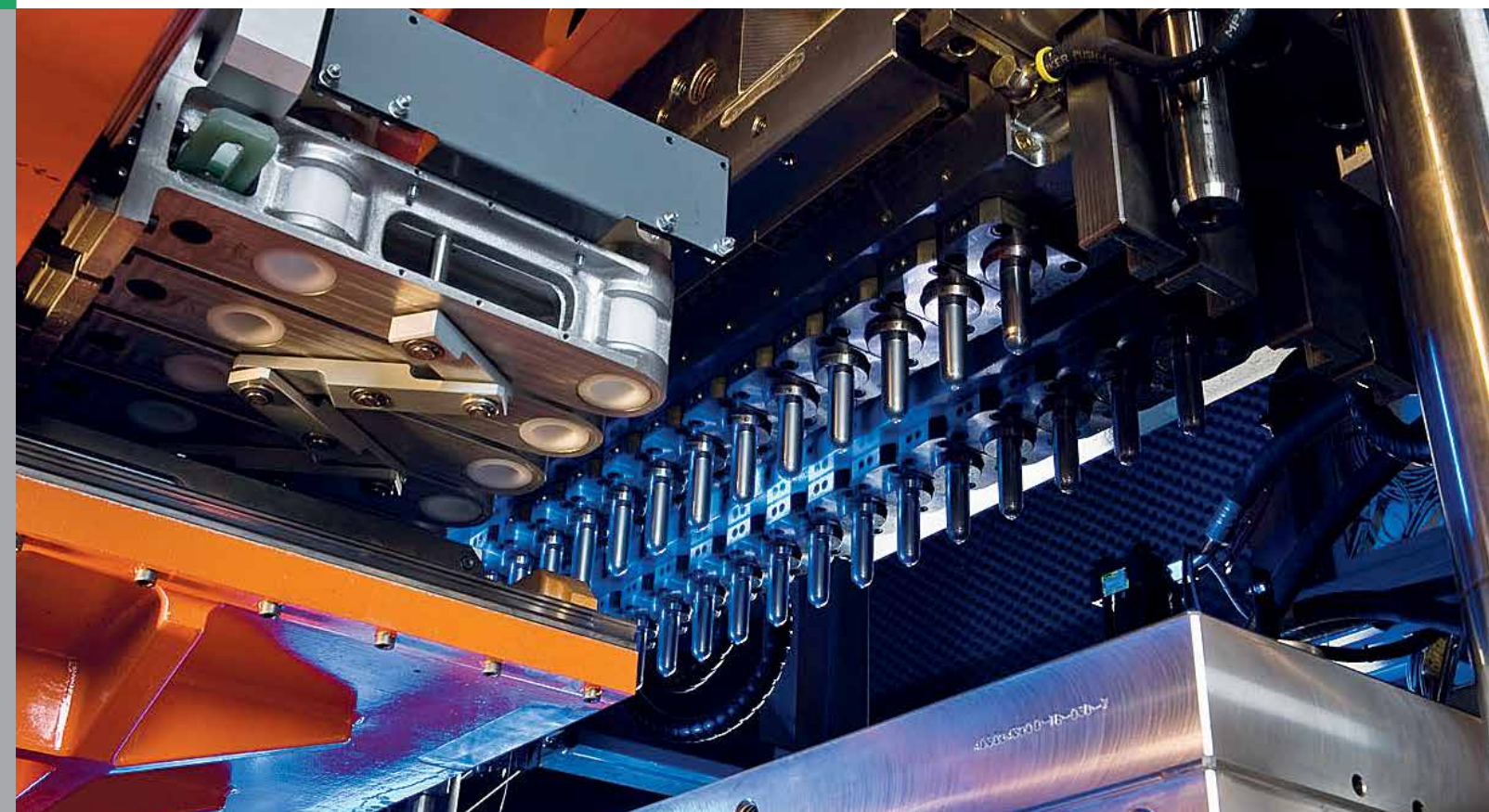
The integrated process offers the intrinsic advantage of producing clean containers.

- PET resin is kept at high temperature level for the entire process, from extrusion to blowing, thus guaranteeing the industrial sterility of the finished container;
- the elimination of preforms storage and handling allows the production of clean containers free of internal and external dust contamination;

- a clean and virtually aseptic container allows a light chemicals treatment during sterilization processes (Aseptic filling) and lower filling temperature (Hot Fill) with the consequent savings on the overall packaging system (light weight, running cost, product integrity etc.);
- in addition, coatings which are required to enhance barrier properties adhere more readily to the surface of the clean container.

Versatility

- SIPA ECS machine has been shown to be extremely versatile in processing materials with very different characteristics compared to standard PET: reground PET, recycled PET granules or flakes PEN, PLA and OPP. It can also produce containers in PET with added with AA reduction agents or reagents such as oxygen scavengers. In this case the integration of injection and blowing does not affect the efficacy of the reagents because no storage is required;
- ECS system can also produce PET bottles added with nylon to increase CO2 barrier, and different master-batches to meet different aesthetic and functional container requirements;
- the integrated system ECS (FX model) can simultaneously produce different size and/or shape containers for 2 bottling lines feeding;
- possibility to produce only preforms.



ECS main features:

- Highest single-step output for beverage bottles, hot fill bottles and wide mouth containers.
- Very good output per capital ratio.
- Possibility of simultaneously producing 2 different containers having different weights.
- Possibility of simultaneously producing containers for different applications (i.e. wide mouth on one side and oval containers on the other).
- Machines can be configured with different cavitation on the 2 sides of the machine (i.e. 32 cavities on one side and 40 on the other).
- Machine can be equipped with different types of preform conditioning on the 2 sides.
- Wide range of custom containers: Hot-fill (narrow neck & wide mouth); oval containers; large sizes.



ECS: innovations and reliability at the top

With unique innovative solutions, the ECS platform is the state-of-the-art of one-step in terms of performance and reliability.

Plasticization

- The extruder continuously plasticizes PET with a specially designed screw eliminating any back-flow of melted material. Thanks to the continuous extrusion, the average melting speed is decreased and results in a lower stress on the material and reduced production of AA.
- Two wide range screws: 120 mm and 140 mm to improve flexibility in the number of injection mold cavities.
- Electric motor for extruder.

Injection

- Continuous control of injection and holding phases as a guarantee of repeatability and quality of the process.
- New hydraulic buffer operated by a software is now available as standard for injection cycle completion in case of power cut-off thus allowing easier mold purge and scrap discharge after power cut-off.

Injection Mold

- Enhanced temperature control of molds (different cooling circuits).
- Individual control of each injection nozzle temperature.
- Each plate has individual cooling circuits.
- Mold with single cam: improved accessibility to facilitate maintenance, simpler hydraulic system, reduced component wears.
- Molds equipped with self-lubricating bushings and wear plates.

Preform handling

- Preforms handling systems allow preforms to be transferred from injection to blowing molds without damages or possible contamination.
- Preforms transfer system is activated by innovative brushless motors which guarantee smooth and reliable operation without maintenance requirement.

Preform conditioning

- SIPA's conditioning systems offer the highest flexibility in the range of containers to be produced: from standard bottles requiring a perfect stretching of the material below the neck, to heat set containers with extreme light-weight, to personalized conditioning of complex-shaped containers (off-centered neck, wide mouth), both for round or oval shapes requiring preferential heating.
- The innovative electro-magnetic induction system particularly suited for ultra clean and aseptic processes.

Stretch-Blowing

- The ECS stretch-blow molding systems allows a longer process time due to the integration with the preform injection process. This enables to stretch-blow mold higher quality containers.
- The linear system of ECS platform guarantees a lower compressed air consumption (comparing same bottle size and machine output) reducing dead volumes.

Operator interface

- Control of the system through a color touch-screen graphic interface.

- The interface is intuitive allowing access to and storage of all control parameters of the machine, alarms and diagnostics, production statistics, maintenance and operation videos, manuals and spare parts lists.
- All machines are provided with a modem connection to SIPA's On-Line Customer Service.

Quick mold changeover

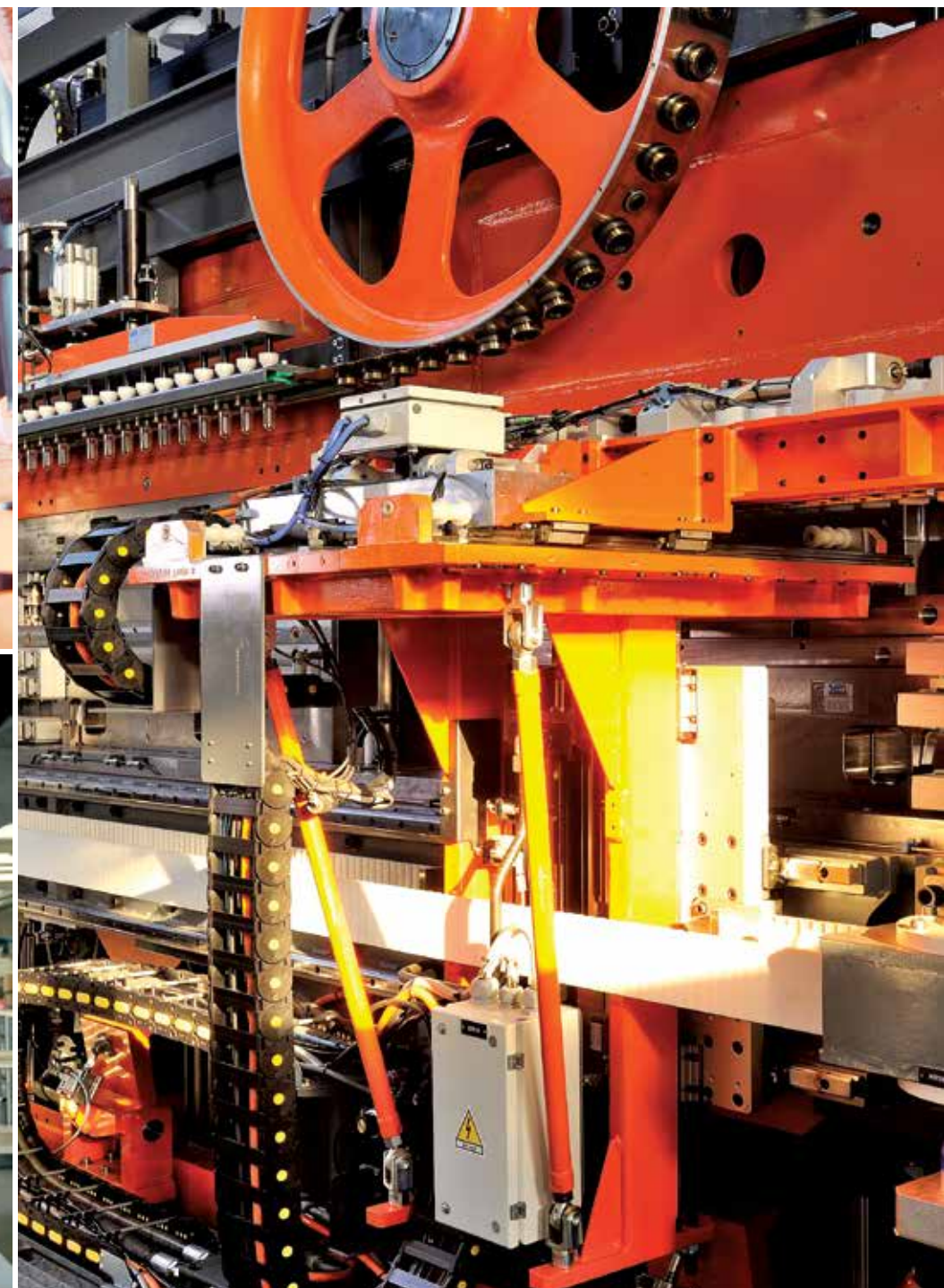
- Thanks to its new quick change system, the total time for complete mold changeover is as little as three and a half hours.

Maintenance

- The ECS EVO has been designed in order to simplify machine operation, accessibility and maintenance.
- The machine can provide detailed diagnostics allowing immediate intervention.
- SIPA has implemented a preventive maintenance plan: a useful tool to guarantee long term efficiency.

System engineering

- SIPA supports the customer with a systems engineering service including:
- PET resin drying auxiliary sizing, room conditioning, compressed air, cooling water.
 - Systems engineering: specific system layout and integration in the plant, piping and cabling distribution and P&I dimensioning.
 - Study of the warehouse and material flow.
 - Energy balance for the production systems.
 - Analysis of the production costs and proposals for cost reductions.



ECS major applications

The ECS system combines the lowest bottle cost to the widest containers and materials versatility.



Wide mouth containers

- Wide mouth containers production with wide range of capacities and thread finish diameters. Wide range of neck finish available: screw, twist-off or snap-in with alu-foil.
- Customized thermal conditioning systems to provide effective preform conditioning: air-knives, cups, electromagnetic induction or infrared for the production of jars with a wide variety of shapes: round, oval, square or customized shape.
- High output production.



Oval & asymmetrical containers

- SIPA's ECS platform, using different technologies for the preferential heating of preforms, can produce asymmetrical containers (centered and off-centered neck) with a wide range of output (from 2,000 to 30,000 b/h).
- Various applications: ex. Containers for dressings and sauces with 100% PET or with amosorb blend; detergent containers with blends of virgin PET and recycled PET, up to 100% of PCR PET.



Hot fillable containers

SIPA's ECS platform can produce any type of heat set container for sensitive products to be hot filled at the required filling temperature with the lowest running cost achievable in the market.

- SIPA was the first systems provider to introduce the amorphous reinforced neck for Hot Fill application without the need of the traditional crystallized neck, thus reducing dramatically the container production cost.
- Thanks to the ECS platform concept, SIPA is the preferred choices for Hot Fillable Ready to Drinks in line producer.
- ECS system allows for a strong weight reduction for heat set containers.



Ultra clean & aseptic containers

- The integrated process reduces microbiological contamination when bottles are blown with filtered air.
- Ultra-clean bottles can be produced, adding to the quality of the container, especially where they are to be used for products with an extended shelf life.
- By avoiding any possible post-contamination, the ECS module is perfectly adapted to production - in a sterile, controlled environment - of aseptic containers ready to be immediately cold filled for high or low acid products (ASIS). In this way the rinsing and sterilization stages of aseptically filled bottles are eliminated, along with the related equipment, leading to significant economies in investment, space savings, a reduction in energy consumption, and an overall simplification of the process.