



SFR EVO³ Rotary Blowing Systems

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Zoppas Industries

SFR EVO³ Rotary Blowing Systems

SIPA



SFR *EVO*³ takes SFR rotary blow molding equipment to the next level

SIPA has a constant will to improve performance and efficiency of its products to bring savings and added value on customer's investments. SIPA has worked on its rotary blowmolding system SFR in order to improve output rates, total cost of ownership, flexibility, and efficiency. The result is the SFR *EVO*³: it is faster, more versatile, more efficient, and it costs less to run.

Packaging solutions

A unique expertise

All the expertise you need, under a single roof. SIPA is already recognized by the market as a highly experienced and innovative partner in the development and engineering of rigid packaging. An extensive product range, which includes equipment for the production of preforms as well as single-stage injection-stretch-blow molding systems, makes SIPA the only supplier in the world that can boast an offering that collects together, under a single roof, all of the following elements: Injection expertise; blowing expertise and wide manufacturing capabilities. The company is able to guarantee the functionality and optimisation of the packaging as a whole: preform, container, closure, label, packaging and palletising.

SIPA has put considerable effort into bottle lightweighting over many years. It has achieved important results in the bottle body and base, as well as in the neck area. With the ability to exploit SIPA's innovative injection mold technology, customers will be able to take full advantage of the most recent advances in preform/bottle and neck lightweighting and capitalize on future developments.

High production rates.

SIPA rotary blow molding machines are designed to assure high process flexibility at high production rates. With SIPA rotary machines, users can produce standard containers at rates of 2,250 bottle/hour/ cavity, complex custom containers such as Heat Set containers for Hot filling at rates up to 1,800 b/hour/cavity, or handling and blowing of very light containers with extremely high preform stretch ratios (above 15). Thanks to the SIPA rotary SFR's unique and optimum oven ventilation system and simple and slow preform handling kinetics, the handling of light and delicate neck finishes remains easy even at such high production rates. The possible applications are numerous: mineral water, carbonated soft drinks, milk and milk based products, edible oil, fruit juices, detergents, isotonics and functional drinks, beer and liguors.



Materials: PET, OPP, PLA, Multilayer

Standard and custom

- Lightweight
- Lightweight
 Heat Set for Hot fill and pasteurization
- Ultra-Clean
- Oltra-Clear
- Light barrier

Type

- Gas barrier
- Humidity barrierAroma barrier
- Active packaging







Innovative solutions and major improvements

For its new SFR EVO³ range, SIPA has put particular attention to improvements that bring savings and added value to customer's investments.

Major achievements

- Increased output = 2,250b/h/c: +12% vs. previous models
- Reduction of total air consumption: -25% vs. previous models
- Reduction of total energy consumption: -30% vs. previous models
- Flexibility: quicker mold changeover and set-up





Preforms loading Star-wheel preform feeding system:

- · Pneumatic gate releases preforms into the star-wheel. Preform is loaded onto the spindle (and not viceversa)
- by means of cam track-driven grippers. · No chain axial movement.
- Automatic ejection of wrongly loaded preforms.
- Quick star-wheel changeover.

2 Preforms handling Simple transport chain:

- · Simple chain in special plastic material (SIPA patent). No maintenance cost and time. No rotation of chain around its axis and no movement
- up and down to collect the preform.
- Dry operation (no grease). • Pitch = 45 mm: better efficiency of heating, shorter
- oven and possibility to blow up to 43 mm neck finish. Quick tool-free spindle changeover when handling different preform neck.
- Possibility to change chain pitch to blow neck up to 43 mm.
- Very low maintenance cost.

3 Thermal conditioning Modular heating oven:

- · Innovative ventilation through the lamps to maximize heat transfer by radiation (convection minimization). Neck ventilation inside heating oven for light-weight
- effective neck cooling
- 8 lamps (first 3 kW, the others 2 kW). Possibility to install all lamps of 3 kW, and an additional lamp for longer preforms.
- · Low thermal inertia: heat process consistency and quick cold start-up.
- Laminar ventilation: better process stability (SIPA patent).
- · Low oven temperature: low consumption.

The SFR range

Seven models are today available: SFR 6 EVO³, SFR 8 EVO³, SFR 10 EVO³, SFR 12 EVO³, SFR 16 EVO³, SFR 20 EVO³ and SFR 24 EVO.³ The number after the acronym indicates the number of blowing cavities. SIPA technical and sales departments are available to supply data related to specific applications.

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

Models	Blowing Cavities	Maximum size (l)	Output* (b/h)
SFR 24 EVO ³	24	3	50,400
SFR 20 EVO ³	20	3	44,000
SFR 16 EVO ³	16	3	36,000
SFR 12 EVO ³	12	3	27,000
SFR 10 EVO ³	10	3	22,500
SFR 8 EVO ³	8	3	18,000
SFR 6 EVO ³	6	3	13,500

Neck dimensions Diameter: up to 43 mm Height: up to 25 mm





Preforms and bottle transfer with only one

degree of freedom (tangential movement):

· Preforms & bottles centrifugal forces are very low.

• Soft and smooth manipulation of preform and bottle necks.

4 Preforms & bottles transfer

· Simple transfer movement.

Only one cam needed.

Very easy adjustment.

· Removal of speed limiting factor.

Smaller diameter.

5 Stretch-blowing "Crocodile" mold opening:

- · Reduced pitch between two molds: relevant space saving (20 to 30%) for the blowing wheel compared to equivalent machines.
- Smaller diameter.
- Lower inertial load and peripheral speed.
- Simplified transfer wheel, small diameter,
- lower peripheral speeds.
- · Easier to maintain accessibility of key elements.
- Quick molds change-over.



- · Discharge on belt conveyor or air conveyor directly feeding the filling lines.

- Shell mold, reversible modification to mount major
- competitors molds.

- · Servo driven unit for bottle discharge.
- Bottle base cooling option in case of Sincro Bloc connection.



Competitive performance and running costs

SFR *EVO*³ range incorporates a number of improvements in order to increase output rates, reduce air and energy consumption, reduce Total Cost of Ownership and increase process flexibility.

Conceived and designed back in 1998, SIPA rotary Blow Molding Machines have benefitted in these years from a series of detailed optimizations in materials and components, as well as from SIPA's extensive experience in preform-bottle design and blowing on the new mechanical system, high pressure process settings. Equipment reliability has been optimized, and guaranteed speeds increased to the maximum available on the market. Thanks to new designs in the clamp unit and in the cams, the SFR EVO³ has a maximum output rate of 2,250 bottles per hour per cavity. which puts it on the front line of the grid with the competition. Blowing circuit configuration, blowing monobloc valves, and up-to-date electronic controls allow the consistent and reliable blowing process control even at such high production rates.

A new blowing valve block, is more compact than before, and has 35% less dead air volume. Customers have the option of taking advantage of mechanical compensation: whereas with traditional pneumatic compensation, the total stroke is made with high pressure blowing air, blowing air is used only on final fraction of a millimeter. This leads to a massive reduction in air consumption, particularly with smaller bottles. Green ovens on the SFR EVO³ are big energy savers. In fact, compared to earlier generations of oven, they reduce electrical consumption by up to 40% with the use of new lamps and special materials and coatings for the reflectors while keeping process conditions stable.

The simplified machine structure and kinematics, along with the patented innovations (oven ventilation, oven chain, mold opening) are the keys for low maintenance costs over the years. In particular:

- the low oven temperatures and the innovative ventilation system reduce the frequency of lamps, mirrors and spindles change; - the lightweight chain made of simple injected technopolymer does not encounter the typical issues of chain elongation and heavy wear and tear;

- the reduced wheels diameters and peripheral speeds, eliminates the need of classic transfer wheel alignment and shimming (no shimming on SIPA blow molders):

- the "crocodile" mold opening and patented compensation system eliminates the need of shock absorbers.





Flexible and efficient

The SFR *EVO*³ range has been conceived to be extremely flexible, guaranteeing the widest process window and quick mold change-over solutions.

Greater flexibility

Also available for the SFR EVO³ is the electrical drive for the stretching rods. This brings much more versatility in fine tuning the process compared to pneumatic drives. Stretch rod timing, speed, acceleration and distance can all be controlled with ease and flexibility from the machine control (HMI). Electric drives are also perfect for SIPA's Sincro-Bloc integrated blowing and filling system, to match the blowing operation to different filler speeds. Electric drives mean there is no need for the stretch rod decelerator and the stretching cam, which among other things helps shorten product change-over times. The electric stretching system on the SFR EVO³ also has a 'smart' self-learning procedure to identify preform/bottle dimensions.

proved efficiency

The SFR EVO³ has a new standard mold changeover system that is quick and easy to use. And a new optional feature that SIPA is currently perfecting should make mold changes even more efficient reducing the changeover time by 50%.

lold changeover

Quick change-over shell molds are similar and interchangeable with all conventional shell type molds, therefore the blow mold changeover operation is well known in the industry. However, the SIPA Mold opening system allows the simultaneous access to more than one station (on a 20-cavity SFR 20 machine 3 molds can be changed at the same time) and therefore in case of more operators available, changeover time is reduced significantly. Process regulation and bottle quality control at each changeover is very quick thanks to the SIPA oven characteristics

Cold fill and Hot fil

Increased efficiency is also built into the molds themselves. The SFR EVO² is much easier to convert from production of cold-fill to hot-fill containers because, while the heating circuit remains in the shell holder, the cooling circuit is now built into the cavity. So only a simple cavity change is required to switch from production of one type of container to another, while the shell holders remain in place. Mold Changeover

- New striker plates to allow rotation of the shell inside the shell holders
 Easy lock system for shells for quick changeover
- (only one side to loose)



Quick bottom mould change over tool-less solution.



Reliable and user friendly

SFR *EVO*³ rotary stretch blow molding machines are designed to be reliable, easy to use and to maintain, guaranteeing the widest process window and excellent quality of the containers to be produced.

Optimum quality containers

Today's need to reduce production costs poses a great challenge: to guarantee optimum guality containers at the lightest possible weight when produced at the fastest rates. SFR machines have proven to be outstanding performers. The patented oven configuration with the most effective ventilation and allows the heating of any preform design, from multilayer to hot fill high IV resin preforms, to very high stretch ratios (up to 15, 16 total stretch ratio), or special containers with no axial stretch ratio whatsoever. There is never the need of going up to high oven temperatures as it is for conventional blow molders. This is a great advantage for a wider process window and for lighter and thinner neck finishes. Thanks to the patented "crocodile" mold opening, the diameters of machine and transfer wheels are much smaller than conventional blow molders with up to 45% slower peripheral speeds. This is a great advantage in preformbottle handling at high speed, especially in case of thin neck finishes

ocess flexibility

The best machine characteristic often appreciated by operators is process flexibility and the wide process window of the SIPA SFR rotary blow molders. Thanks to the oven configuration, for the same container it becomes very simple to adapt the process to a large variety of preforms with different dimensions, and even different resins, while easily managing variations of ambient temperature and humidity.

Compact and clear

Patented Oven ventilation allows for the following: - simple installation of an optional oven air filtration hood with great advantage to prevent dust contamination inside the machine and the oven. This air filtration hood in association with the grease free oven chain, makes the SIPA oven the only clean oven in the category with the best guarantees against preform contamination; - electric cabinets are placed underneath the ovens (optimum space utilization); - ovens are placed at 2 m height and allow for an operator passage underneath with easy access to all machine sides: - thanks to the mold opening the SFR machines. wheels diameters are smaller, thus making the machines the most compact in the market.

Viaintenance

Ordinary maintenance to be carried out by the operator is limited to checking the blowing circuit and valves with particular care to perfect service and blowing air quality and filtration. Meticulous regular checks must be done for all static position sensors. Their cleanliness and position is vital for the proper smooth running of the machine at such high speeds.

As far as Preventive Maintenance is concerned, the SIPA Service Organisation offers favourable conditions. Carrying out regular and correct Preventive Maintenance is in fact the only way to guarantee high machine utilization rates while minimizing downtime.

