2009-10 CE ISO 9001

SMPA6

Automatic Stretch-blow Molding Machine

smargon

SMPA6

Delivers quality plastic packages at high speeds

Based on Smargon's plenty expertise and know-now in PET bottle blowing, SMPA6 automatic stretch blow molding machine has been entirely redesigned. Its development has led to new high-speed manufacturing solutions aimed at productivity and package quality for PET bottles ranging from 0.05 to 1.5 liters.

These performance improvements stem from efforts that have not only targeted blowing machine advances, they have also involved a full-blown "bottle solutions" development program, from PET bottle design to mold manufacturing. When it comes to your needs for high yield and high quality bottles, the new SMPA equipment delivers.

Smargon has devoted unparalleled means to qualifying the new generation of SMPA6 blowers. Versatility, yield, reduced operating costs: these unavoidable goals force us to innovate.

Choosing the right machine to match your needs

SMPA6 is designed on a linear concept, and incorporate state-of-the-art technology developed for modern stretch-blow systems.

Operation and maintenance of machines is especially easy and fast due to the optimum ergonomic design and the fact that all main parts, and all phases of the process are readily accessible.

Low Capital Investment

- Low initial investment and start-up costs for this linear, simple and cost-effective system.

Simplicity

- Easy to use and operate.
- Process phases and the main units are highly visible and easy to access.

Precise Control

- OMRON control system with touch screen monitor.
- All parameters and regulation for the subsequent bottle are set by the computer.

Compactness

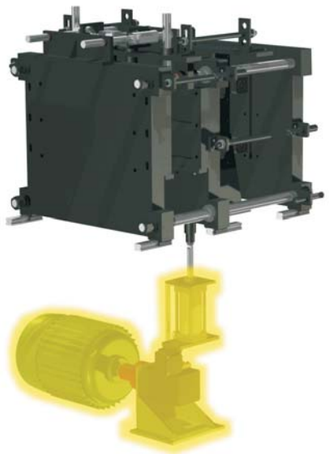
- Designed to utilize a minimum of space.

Reliability

- All Smargon's processes have ISO 9001 approval
- SMPA6 machines is robust and have few expendable components.

Less Maintenance

- More economical - less wear.
- Easy to maintain due to the simple structure, which is easy to access and has high visibility of all components.



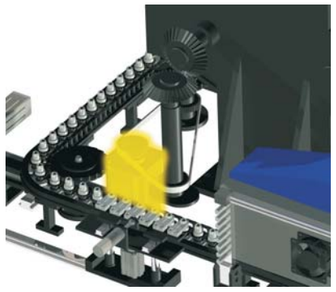
Fast and reliable

Reliable Clamping

At the heart of the machine's mechanics, the clamping unit relies on a hydraulic-mechanical joint drive concept. YUKEN (Japan) hydraulic pump&valve package ensure fast feedback and reliable hydraulic force output. All of the cam-driven movements, including blowing mold unit opening & closing and mold base up & down drive can reach speeds of up to 1,100 bottles/hour/cavity.

High Speed of Blowing/Exhausting

New blowing valves contribute to speed increase, thanks to optimized air flow and reduced dead space. Along with better response time, reduced dead space helps reduce air consumption.

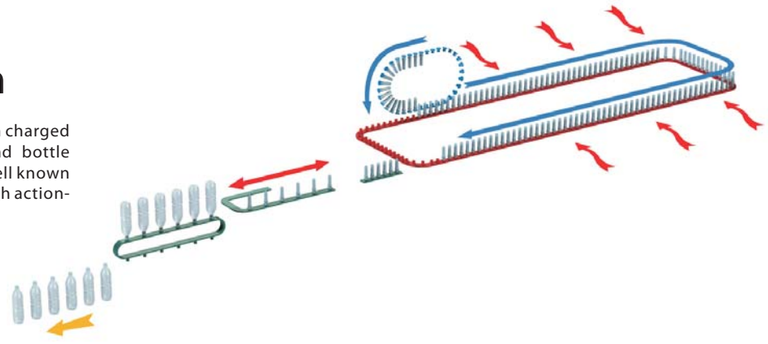


Servo Motor Driven

YASKAWA (Japan) servo driven system has been charged of stretching, preform/bottle transferring and bottle discharging respectively on SMPA6, which is well known by its fast & adjustable speed, low vibration, high action-repetition and precise position control.

Reduce Cycle Time

The reheating unit, transfer and blowing unit all have independent drives for optimized individual cycles. This unique feature offers the flexibility to adjust blowing time according to the final bottle, while the dry mechanical cycle time remains the same.



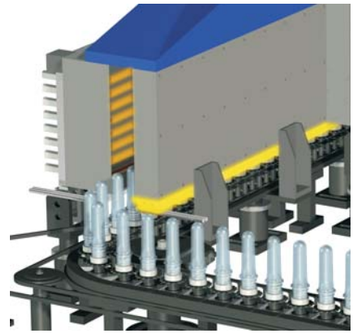
Best bottle quality

Perfect Bottles

SMPA6 handles preform or bottle by the neck only. No contact occurs between mechanical parts and material under preform neck until bottle is blown; this prevents any defects on the finished package.

No Neck Deformation

Throughout the reheating process, aluminum-made water-cooled protection ramps keep necks at low temperature to avoid deformation. This risk is limited further thanks to reliable design blowing nozzles that reduce stress on preform neck by balancing pressure on both sides of neck during blowing.



Optimized Material Distribution

For preform heating, the 8 infrared lamp modules on the progressive pitch rack ensure precision of the longitudinal heating profile. The rotations of preforms in front of lamps provide perfect homogeneity of circumferential temperature. By the help of YASKAWA (Japan) servo motor driven, SMPA6 can carry out different stretching speed according to different bottle's requirement. These combined features result in an even material thickness that guarantees superior bottle appearance and makes it possible to reduce bottle weight.

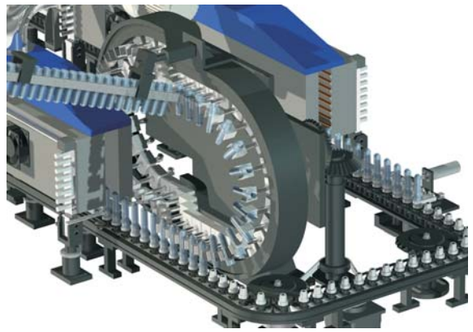
Stretching of Critical Zones

During reheating, a heat gradient is created between under neck ring zone facing high power 2000W IR lamps and the neck itself, kept at low temperature. Thanks to this gradient, under neck ring material can be fully and uniformly stretched: reducing wall thickness helps bottle light-weighting. For validation purpose, overheating tests show that all areas of preform body can be heated up to the highest temperature, without the neck being affected.

A perfect solution

Preform Loading & Transferring

A reliable and robust preform loader ensures constant feeding of the preform from storage hopper. The preforms, turned upside down, are loaded onto the finger-like holder by the infeed wheel, and moved by synchronizing motor driven. In conclusion, preform loading and transferring is a continuous action without interval, and can coincide with blowing process to achieve possible short cycle.

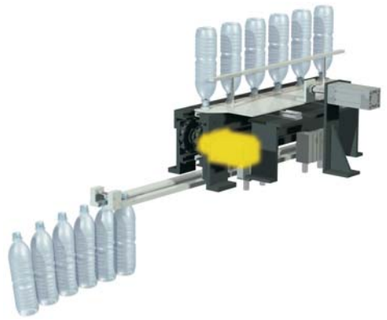


Center Distance Changing

The smaller the center distance for abutting preform in heating unit is, the more ideal it is for heating power saving. But, too small center distance will be impossible for bottle production. So, special designed center changing unit has been adopted on SMPA6 machine to solve such conflict. With the system, the abutting preform's center distance will be 50.8mm during heating, and will change to 114mm during blowing to ensure the machine to produce bottle up to 1.5 liter.

Bottle Discharging

Servo & pneumatic combined driven package ensure fast and reliable bottle discharging. After receiving the ready-blown bottle from main sliding rail unit's claw, the whole bottle discharging process will finish synchronously along with machine's blowing process, and don't affect machine's dry-cycle. It also makes SMPA6 possible to match with additional air conveyer to transport the discharged bottle to filling machine directly.



Shock Absorber & Linear Guide

For machine, lower shock during running means lower wear and tear and longer service life. RB series shock absorber has been widely adopted on SMPA6 machine, which can withstand an impact speed of 16 ft/sec and has a specially designed orifice that compensates for varying speeds and loads to consistently decelerate loads.

High quality THK (Japan) LM Guide (HSR series, full-ball type) on SMPA6 machine are for horizontal moving guide, including mold open&close and preform's transferring. It can receive a well-balanced preload, increasing the rigidity in the four directions while maintaining a constant, low friction coefficient.

Technical Specification

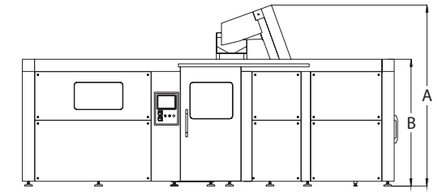
Model		SMPA6
Mold Cavity	Number	6
Max Bottle Diameter	MM	90
Max Bottle Height	MM	330
Neck Range	MM	15~30
Bottle Volume	Liter	Up to 1.5
Max Nominal Output*	B/H	6000
Heating Zone	Number	6
Heating Lamp	Number	48
Heating Capacity	KW	75
Installed Electrical Load, Standard	KVA	97
Mold Thickness	MM	200
Operating Pressure	Bar	8~10
Blowing Pressure	Bar	25~35
Basic Machine Weight	Ton	5.5

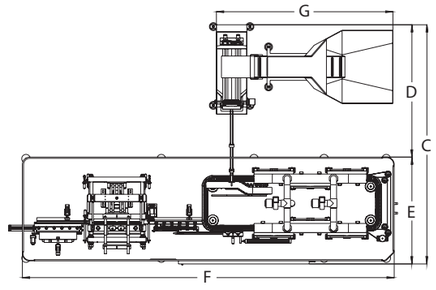
Figures in above table are subject to change without prior notice.

* Depending on preform, bottle design, bottle size and material.

Platform Layout & Data

	SMPA6
A	3000
B	2100
C	3920
D	2170
E	1750
F	6100
G	2900





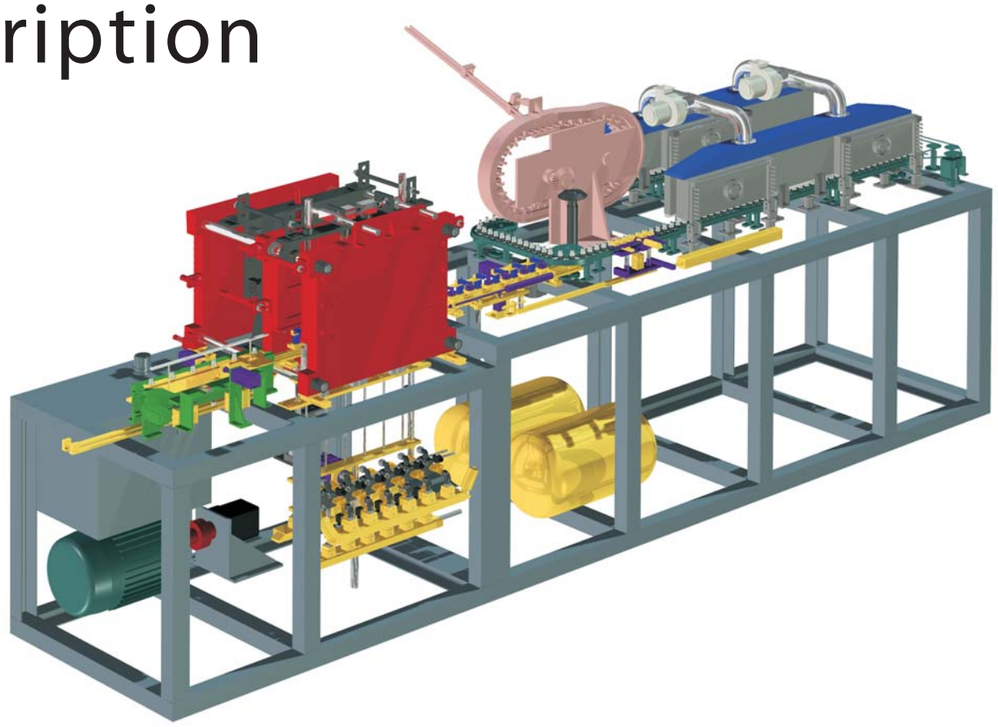
Operating Description

Preform Feeding

The preforms are unloaded in bulk into the preform hopper and are then transported by an elevator belt, the speed of which is controlled by the electronics of the machine. The preforms are lowered by gravity, neck up, into the infeed wheel socket that feeds the machine. Driven by synchronizing motor, the preforms will be transferred continuously along the heating tunnel without any interval.

Heating Condition

Each of the parallel ovens is equipped with 8 infrared lamps. During the heating phase, the preforms, neck down, are constantly rotated for a perfectly symmetrical distribution of heat. The ovens are ventilated in order to maintain their internal temperature at a sufficiently low level and avoid excessively high temperature on the external wall of the preforms. Inside the oven, the necks of the preforms are protected from over-heating by means of two aluminum-made protection ramps, cooled with cold water.



Center Distance Changeover

Upon leaving the heating conditioning, the preform will go into center distance changeover position. By slider&jaw, the abutting preform's center distance will change from 50.8mm during heating to 114mm for blowing, which can ensure the machine to produce bottle up to 1.5 liter.

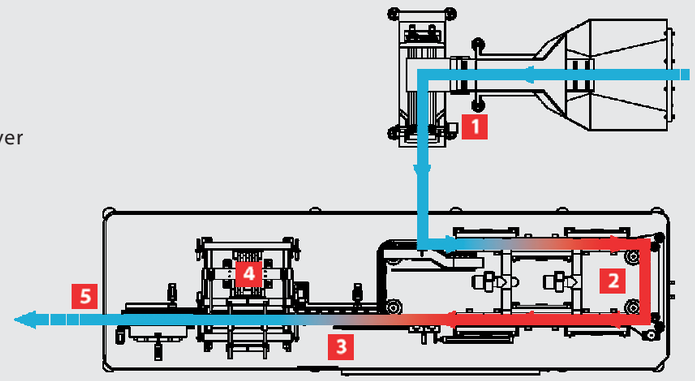
Stretch-Blow

After center distance changeover, the preforms are introduced into the blowing mold. The longitudinal stretching of the preform is carried out by the stretching rod, whose speed and stroke can be adjusted via servo driven. The rate of stretching is controllable in all instances. Pre-blowing at medium pressure can be adjusted by means of manual valves that make it possible to synchronize it with the stretching. The high-pressure blowing is activated after the pre-blowing, with adjustable times

Bottle Discharging

The blown bottles are removed from the molds and freed from the slider&jaw by means of a simple mechanical system. The bottles can be evacuated either in bulk on a conveyor belt that feeds a silo, or on air transporters that directly feed the filling lines.

1. Preform Feeding
2. Preform Heating
3. Center Distance Changeover
4. Stretch-Blowing
5. Bottle Discharging



Process Management

An electronic control panel with programmable logic controller (PLC) manages all movements, alerts the operator and makes a diagnosis in case of machine stops. MMI with touch screen is dedicated to the management of the machine and guarantees the operation. It is possible to adjust all process parameters (i.e. lamp temperatures, pre-blowing and blowing time) directly from the machine's supervisor without any mechanical adjustment on the machine. The operational data is stored for specific bottle sizes, shape or application and is recalled when the production of the specific bottle starts again. The new touch screen interface for the management of the machine is a modern, multimedia supervisor. Particular care was taken in choosing icons and graphic symbols easily understood by the operator. Help or trouble-shooting is also available, as well as electrical schemes and user manual.

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