SIPA'S CUSTOMIZED PET PREFORM PROCESSING TECHNOLOGIES HAVE APPLICATIONS IN MIND

SIPA stands alone in the PET preform production arena with the breadth of technologies it offers to its many and varied customers. Unlike others, SIPA does not believe that a single type of machine is best for both high and low cavitation molds. While it is certainly true that offering more than one type of machine adds important costs to the development budget, it is just as true that offering just one type of machine comes at a cost to the customer - in terms of choice and, in the long run, in terms of their own bottom line, since they may end up with equipment not fully fit for purpose. SIPA puts its customers' needs at the center of its development efforts. It is for this reason that the company has developed several families of machines, each with its own distinctive technology and set of operating characteristics, for different sectors of the global packaging industry.

The world of PET preforms and bottles is rich and varied. PET preform producers and users across the planet have a wide range of requirements in terms of shape, size, functionality, and output. Companies in the mainstream drinks business most often need to produce standard preforms in high volumes, while processors and converters operating in specialist areas are more likely to need special preforms, possibly designed to their specific needs, and produced in rather lower quantities.

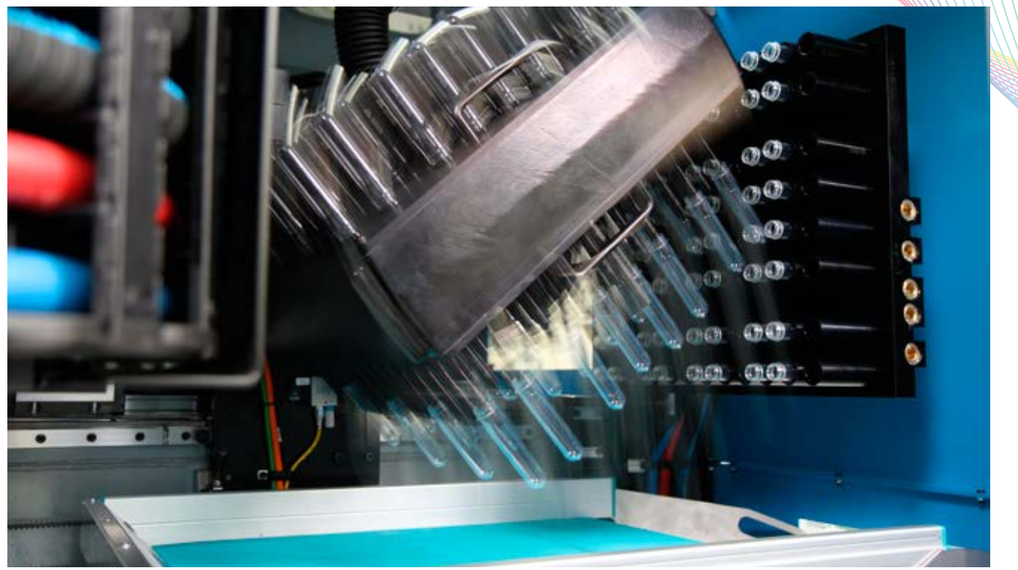
"We do not believe that the same design is just as good for a small producer making a limited number of preforms for special applications such as detergents as it is for a major in the beverage sector producing many millions of ultra-lightweight preforms," says Stefano Baldassar. No single preform production system can cater for all these different demands—which is why SIPA for its part also offers a rich and varied range of equipment. It is not always a simple task to decide which machine is right for you, especially as the choice in recent months has become even more diverse, so on the following pages we provide a run-through of all that is available.

The full SIPA line-up for production of PET preforms now comprises the following:

XFORM

The XFORM platform for highly cost-efficient production of PET preforms by conventional injection molding includes models to accommodate diverse production requirements:

- **XFORM 500.** This is SIPA's largest injection molding system, based on a 500-tonne machine with a double-toggle clamp. XFORM



XFORM 150 Cooling System

500 stands out with its high energy efficiency and low maintenance costs, and its ability to accept molds built by any manufacturer. It is for molds with many cavities, molds with a weight that demands a clamp system capable of handling heavy loads, and for long periods.

• **The XFORM 150/300** family is for smaller molds, with lower cavitation, and which are ideally suited to electrically-driven two-platen clamp systems. These two machines, developed with Athena Automation, the Canadian company founded by PET technology pioneer Robert Schad, have clamp forces of 150 and 300 tonnes respectively. With their ability to produce a wide range of preform shapes and sizes, including thick-walled types, they provide users with a high degree of production flexibility.

• **XTREME.** The latest addition to the range, this is a revolutionary injection-compression molding system intended specifically for processors wanting to produce preforms for extremely lightweight bottles. It is the best - and cleanest - solution on the market for high-speed production of lightweight preforms destined for bottles for water and aseptic filling.

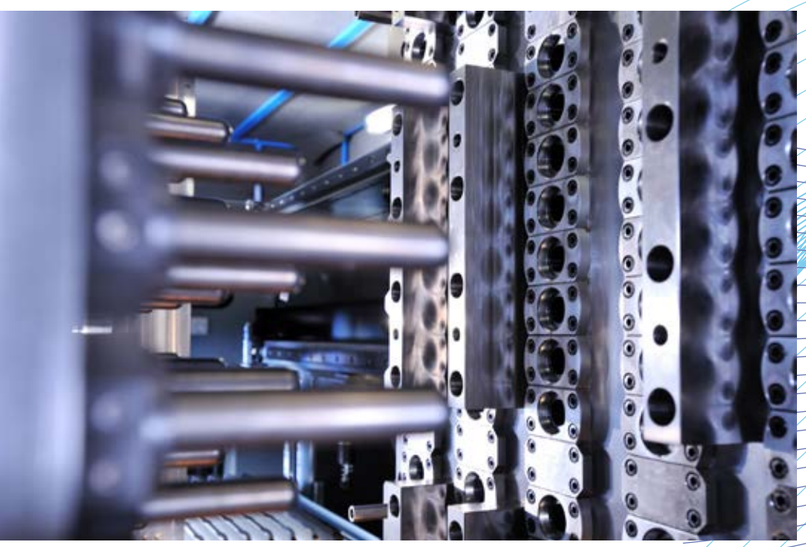
The XFORM 500

XFORM 500: HIGH OUTPUT OF STANDARD PREFORMS

The original XFORM, the 500-tonne XFORM 500, is designed to handle very large preform molds, with up to 144 cavities. It accepts molds from all the world's leading preform mold manufacturers. It stands among the leaders in terms of speed, with a dry cycle time of 1.6 seconds or better on a 400-mm stroke.

Cost of ownership of the XFORM 500 is the lowest of any machine in its class. Initial investment costs are especially low for processors with an existing park of preform molds. Low maintenance, high efficiency, and water consumption that is lower than any rival, all help to minimize running costs. Mold wear is very low, thanks to such features as the robust construction of the double-toggle clamp unit and its even clamp force distribution. The XFORM 500 boasts the lowest platen deflection in the industry. Machine operators and maintenance staff will appreciate the ease of access to the mold area for inspection and component replacement.

On the injection unit side, the XFORM 500 uses the classical configuration of a continuously running extruder feeding a shooting pot. The very low screw rotation speed ensures that material stress is low and there is only minimal reduction in intrinsic viscosity. Up to 50% of recycled flakes can be incorporated into the feedstock without the need for any modifications to the standard plasticating group. The XFORM 500 can be fitted with either a 120-mm or 140-mm extruder, with respective outputs of 800 and 1200 kg/h. The XFORM 500 now features SIPA's new EVO™ cooling robot, which provides the most effecti-



XFORM 500 - Preform molding

ve cooling yet of preform body and neck, helping the processor cut cycle times while improving dimensional consistency in the product. In tune with the concept of the XFORM 500 injection molding machine itself, the new EVO™ robot accepts legacy EOATs (End Of Arm Tools), increasing even further the flexibility of the machine and eliminating additional costs for the user.

XFORM 150 AND XFORM 300: FLEXIBLE, ENERGY-EFFICIENT, EASY TO INSTALL

The XFORM 500 for high-series production is complemented by two smaller systems, XFORM 150 and XFORM 300. Both allow for the highest cavitation at their respective tonnage: 48 cavities for the XFORM 150, and 96 cavities on the XFORM 300. They are ideal for frequent mold changes and special preform production. These two systems benefit from electrically-driven two-platen clamp units. Both also have two-stage extruder/shooting pot injection systems, and the XFORM 150 can also be fitted with a hydraulic reciprocating screw drive. In all cases, energy efficiency is excellent. Neither servo-valves nor oil accumulator are necessary on this platform. In common with the XFORM 500, the XFORM 150 and XFORM 300 feature outstanding

The XFORM 300

platen parallelism, wide tie bar spacing and sensitive mold protection. They too will accept legacy molds from all leading mold manufacturers, and like their big brother they can also be fitted with an innovative post-mold cooling system that, in its DUO™ configuration, cools the preforms for up to six cycles.

The XFORM 150 and XFORM 300 both handle multiple PET preform applications: mineral water, soft drinks juices, cold teas, dairy products, beer, edible oils, detergents, foods, and more. Both machines are engineered for quick and easy mold changeovers, so the time between production of one type of preform and another completely different one can often be under an hour. Both systems have footprints in terms of floorspace that are among the smallest in the industry.

XTREME: HIGH SPEED, LOW PRESSURE, HYGIENIC, LOW AA PRODUCTION FOR WATER, ASEPTIC APPLICATIONS

With the radical XTREME injec-

XTREME

tion-compression molding system, SIPA has taken PET preform production into a new dimension. It is now possible to produce preforms that are up to 10% lighter than even the lightest injection molded preform – but without losing any key properties. More weight can be shaved off the body and base of the preform than ever before. For the first time, XTREME enables the production of a preform for a 500-mL bottle that weighs just six grams.

These advantages, together with low energy consumption, low transport costs, and reduced waste production, all combine to yield preform costs that are lower than on any other production system in the world. Preform molds in blocks of three cavities are mounted on a high-speed carousel.

A continuously rotating extruder delivers melt to dosing devices mounted directly under the molds. There is no hot runner system in the conventional sense.

The XTREME system is very simple to operate, and uses only pneumatic valves. No hydraulics are used, which is an extra bonus in terms of cleanliness.

The whole system fits into a space covering less than 35 m^2.

The pressure involved in the molding process is a fraction of the one used in conventional injection molding. This has a significant effect on stress levels in the preform, and improves mechanical properties as well as aesthetics. Lower injection pressures, together with the lower clamp forces that can be used, reduce acetaldehyde levels and extend mold life.

Finally, XTREME provides developers with the freedom to create new and unique designs. There is almost no limitation on wall thickness, and L/t can be up to 80 – close to twice that normally possible with injection molding.

		APPLICATIONS			
	CAVITIES	MW/ASEPTIC	CSD	HOT FILL	SPECIALTIES
XFORM 500	144	++	+++	++	+
	128	+++	+++	++	+
	96	+++	+++	++	+
	72	+++	+++	++	+
XFORM 300	96	++	+++	+++	+++
	72	+	+++	+++	+++
	48	++	+++	+++	+++
	24	+	+++	+++	+++
	16	+	+++	+++	+++
	8	+	+++	+++	+++
XFORM 150	48	++	+++	+++	+++
	32	+	+++	+++	+++
	24	+	+++	+++	+++
	16	+	+++	+++	+++
	12	+	+++	+++	+++
	8	+	+++	+++	+++
	6	+	+++	+++	+++
	4	+	+++	+++	+++
XTREME		++++	+	--	--
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The XFORM 150