XFORM

PREFORM-MOLDING
TECHNOLOGY

SIPA

AN EXTRAORDINARY PREFORMING EXPERIENCE

WANT TO ACHIEVE HIGHER PREFORM QUALITY, BETTER ENERGY EFFICIENCY AND ULTIMATELY A SIGNIFICANTLY LOWER CONVERSION COST?

- **<200** Wh/kg — energy consumption
- **100%** rPET — pellets capabilities
- **11** million — cold half cycles guaranteed
- **100%** compatibility — with legacy tooling
- **<1%** maintenance — cost of total investment

DESIGNED TO BE OPEN WITH NO LIMITS

SIPA's XFORM GEN4 XP preform-molding technology delivers the **lowest conversion** cost along with **unmatched energy efficiency** and **ease of use**.
It runs with molds **from 2 to 200 cavities** as well as **legacy tooling**.
The wide **HMI** with self-setting process set-up and troubleshooting tutorials brings an effortless user experience.
XFORM is **built to last**: this machine has been engineered to convey the **highest platform robustness** along with **less than 1% of total investment** on **maintenance costs**, making virgin **PET and rPET** preform manufacturing the best experience ever.

THE XFORM GEN4 XP DELIVERS:

- Best in class energy efficiency
- Full flexibility in running legacy tooling
- Extremely low maintenance costs
- Outstanding preform quality
- Ultimately the lowest transformation cost
- New HMI including self-setting process set-up and troubleshooting tutorial

WHAT MAKES XFORM UNIQUE

ENERGY SAVINGS

SUSTAINABLE FEATURES

LOW MAINTENANCE COST

FLEXIBILITY

HIGH UPTIME

QUALITY & CONSISTENCY

WIDE & INTUITIVE HMI

LOW TCO

ENERGY SAVINGS

KEY technical features to reach very low energy consumption rates

- Energy down to 195 Wh/kg for machine & tooling
- KERS (Kinetic Energy Recovery System) reduces power peaks = less stress for electric infrastructure
- Electrical toggle clamp
- Double servo-driven hydraulic pumps designed to guarantee virtually no vibrations even at ultra-fast cycle times
- Insulated barrel = no energy loss

SUSTAINABLE FEATURES

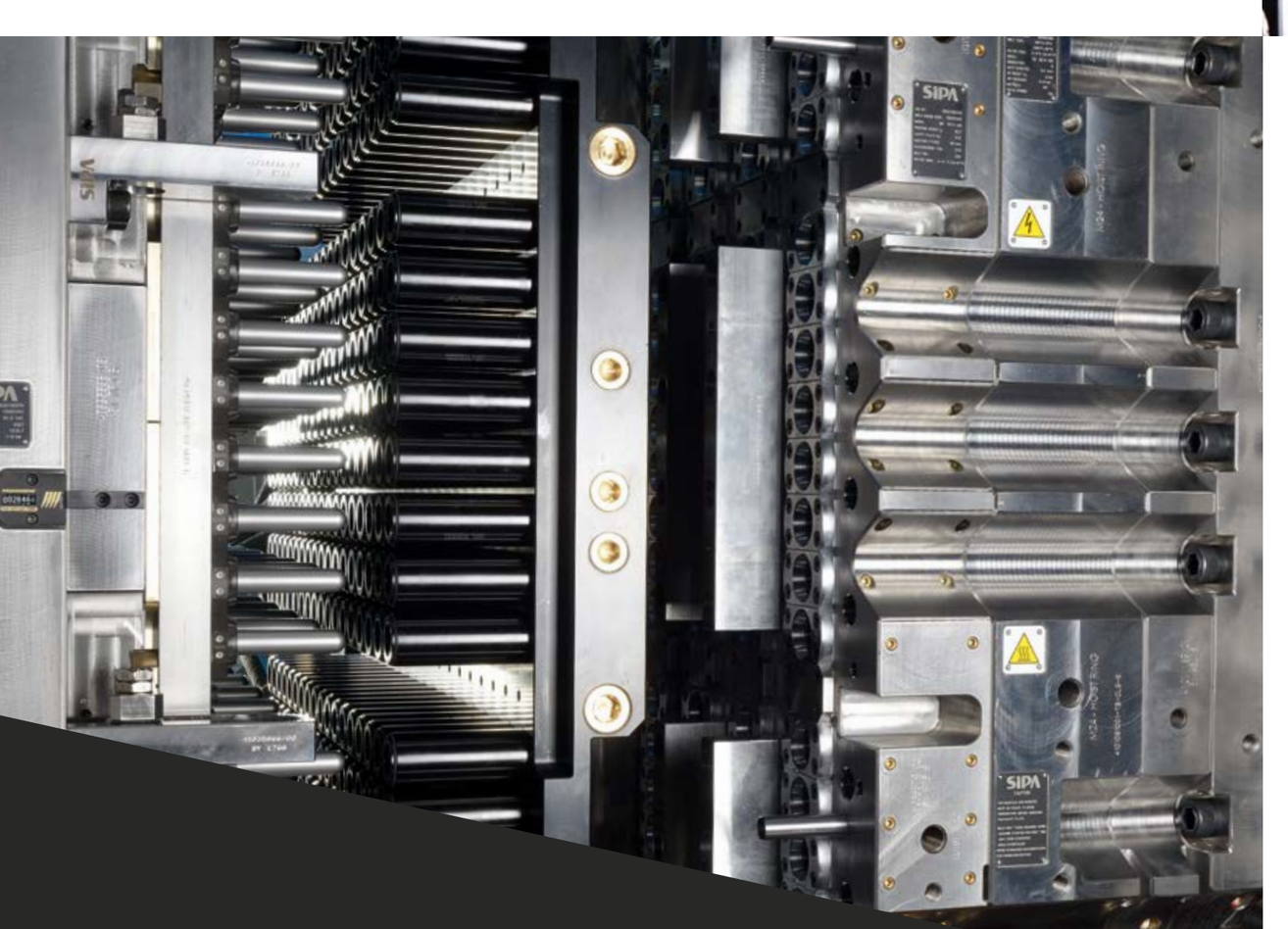
A preform production system compatible with the environment

- High preform quality with up to 100% rPET content starting from pellets
- Up to 100% rPET recycled pellets can be used, without any modifications to the standard plasticization group
- Less kw/kg leads to a massive carbon footprint reduction
- High-injection pressure allows for ultrathin preform walls, leading to significant material saving

MAINTENANCE COST

Record-low maintenance costs for machine and tooling

- XFORM platforms features a state-of-the-art double toggle clamp unit designed to guarantee **virtually no vibrations** even at ultra-fast cycle times: dramatically **reduce wear and costs for machine maintenance** to a level never experienced before
- The **platens are designed to guarantee a very even force distribution and an excellent parallelism** leading to a significantly longer mold life and **reduction in refurbishment costs**
- Very limited mold wear due to very smooth closing profile, gentle injection and the lowest platen deflection in the industry
- **Cold half: 11 million cycles guaranteed** (when selecting the LongLife™ option)
- Reduced material stress and IV drop with extremely low screw rotation speed



FLEXIBILITY

XFORM runs with molds from 2 to 200 cavities as well as legacy tooling

- **XFORM** stands out from other brands in the global marketplace in its ability to **accept preform tooling from other major producers**
- **XFORM GEN 4** not only accepts non-SIPA molds and EOATs, it can also **accept pin plates** for preform cooling and removal **coming from alternative suppliers**
- Mold change is not a headache anymore: the special post-mold cooling design allows for a very wide access area during mold-change, leading to significant reduction of downtime and increase operator safety

HIGH UPTIME

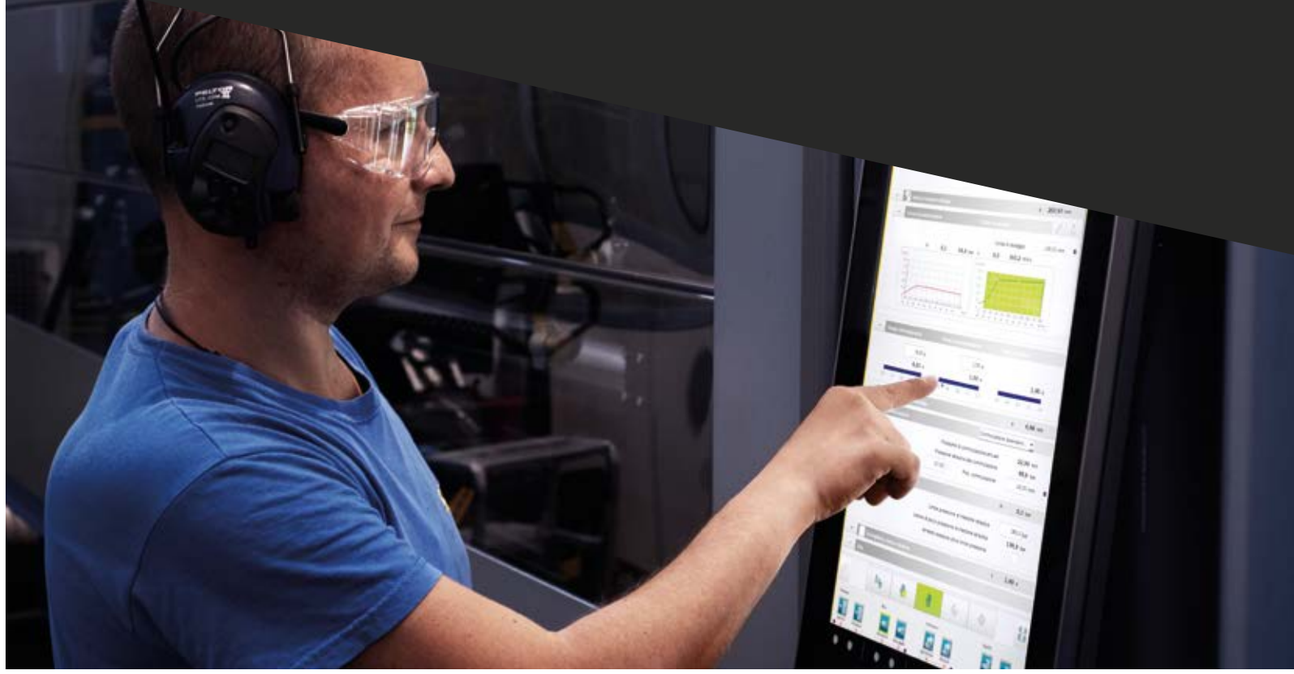
Easy and fast changeover thanks to enhanced mold accessibility

- Easy and fast changeover
- The innovative post-mold cooling system allows for the fastest mold change in the industry
- Less photoeyes reduce machine stops
- Plenum self-standing structure guarantees no preform left in the EOAT
- Faster troubleshooting for higher uptime thanks to troubleshooting tutorial

QUALITY & CONSISTENCY

Designed to handle the most demanding applications

- Optimal preform weight distribution thanks to best in class hot runner design
- Extremely low PET degradation and dead spots (low AA levels)
- <0.025% shot-to-shot variaton (on 96 cavity tooling)
- Best possible cooling to maximize productivity with high quality preform



WIDE & INTUITIVE HMI

For an effortless user experience

- **CC 300 HMI with built-in troubleshooting tutorial:**
  - Description of preform defect
  - List of possible causes of the defect
  - List of corrective actions
  - Potential effect when blowing the preform
- **Benefits for the customer:**
  - Lower scrap rate & higher amount of good preforms
  - Faster troubleshooting & higher uptime
  - No need for ultra-high operator skill & more flexibility in operator scheduling
  - Prediction of blowing performance & better handling of issues at customer site

LOW TCO

The lowest conversion cost in its class

- Less than 1% of total investment on maintenance costs
- **Fast** = higher O/C, lower depreciation cost
- **Energy efficient** = less kW for kg of resin processed
- **Easy to changeover** = higher uptime
- **Fault-proof preform transfer** = higher uptime
- **Help the operator** maintaining good quality
- **Fully compatible** with virtually all legacy tooling = no incremental capex
- **Enhanced sustainability** = 100% rPET capability

A FLEXIBLE AND VERSATILE SYSTEM

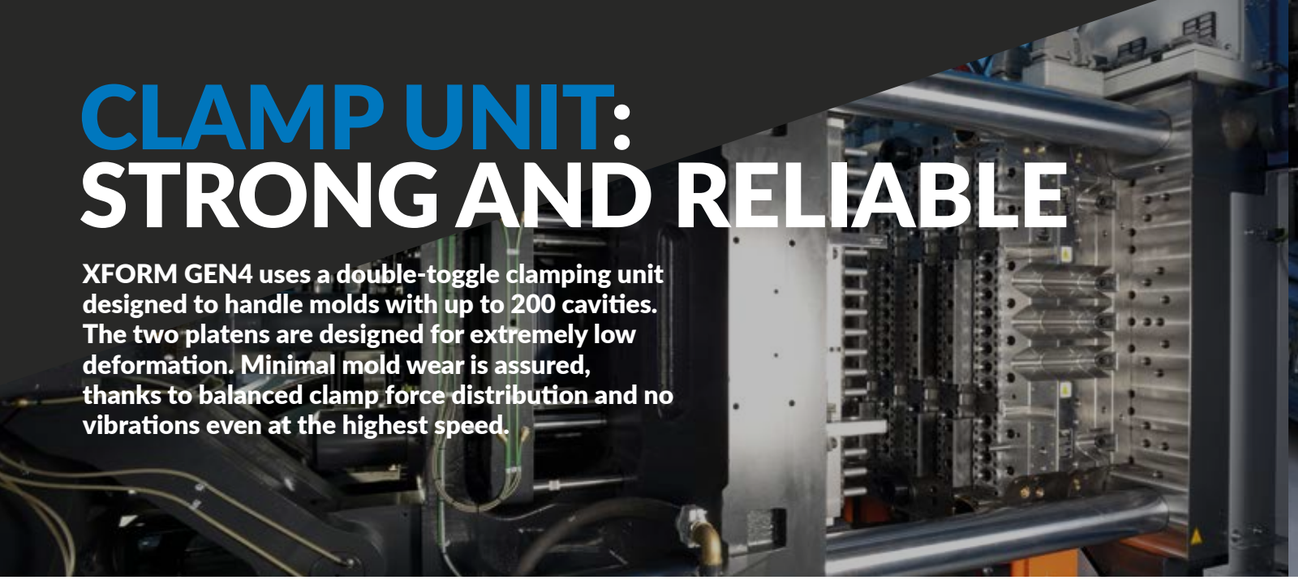
XFORM 500				
Cavitation	**Max preform NF diameter**	**Z diameter**	**Body diameter**	**Rows x Columns**
200	28 mm	33 mm	26 mm	20 x 10
180	30 mm	34 mm	27,5 mm	18 x 10
144	30 mm	34 mm	29 mm	18 x 8
128	38 mm	43 mm	33 mm	16 x 8
96	43 mm	48 mm	40 mm	12 x 8
72	48 mm	53 mm	47 mm	12 x 6
48	63 mm	65 mm	59 mm	12 x 4
32	70 mm	72 mm	68 mm	8 x 4
24	80 mm	82 mm	78 mm	6 x 4

XFORM 350				
Cavitation	**Max preform NF diameter**	**Z diameter**	**Body diameter**	**Rows x Columns**
128	30 mm	34 mm	29 mm	16 x 8
96	38 mm	43 mm	33 mm	12 x 8
72	43 mm	48 mm	40 mm	12 x 6
48	48 mm	53 mm	47 mm	12 x 4
32	63 mm	65 mm	59 mm	8 x 4
24	70 mm	72 mm	68 mm	6 x 4
16	80 mm	82 mm	78 mm	8 x 2

XFORM 250				
Cavitation	**Max preform NF diameter**	**Z diameter**	**Body diameter**	**Rows x Columns**
96	30 mm	34 mm	29 mm	12 x 8
72	38 mm	43 mm	33 mm	12 x 6
48	43 mm	48 mm	40 mm	12 x 4
32	48 mm	53 mm	47 mm	8 x 4
24	63 mm	65 mm	61 mm	6 x 4
16	70 mm	72 mm	68 mm	8 x 2
8	80 mm	82 mm	78 mm	4 x 2

Mold changeover has never been that simple

The special post-mold cooling design allows for a very wide access area during mold-change, leading to significant reduction of downtime and increase operator safety.



CLAMP UNIT: STRONG AND RELIABLE

XFORM GEN4 uses a double-toggle clamping unit designed to handle molds with up to 200 cavities. The two platens are designed for extremely low deformation. Minimal mold wear is assured, thanks to balanced clamp force distribution and no vibrations even at the highest speed.

PLASTICIZATION SYSTEM: LOW MATERIAL STRESS

XFORM GEN4 uses the classical configuration of a continuously- running extruder feeding a shooting pot. The extruder uses electric motor drives. The optimized plasticization screw helps to keep the lowed acetaldeyde levels.

FEATURES AND BENEFITS OF THE TOGGLE SYSTEM

Very smooth closing profile:

- Less stress to the components in the mold closing phase
- Zero vibrations, affecting overall system reliability in the long term

Clamp designed with higher Safety Factor (SF):

- High platen thickness
- 3 oversized carriages for mobile platen
- Consistent platen parallelism over time
- Larger rail surface, less wear
- Rails and bearings designed for lifetime operation

Toggle pins and rail bearings designed for lifetime operation:

- Lower maintenance costs
- No downtime for worn parts replacement

Simple system (same system for clamp locking and clamp tonnage):

- No high-pressure hydraulic cylinder to rebuild periodically
- Simpler hydraulic circuit, less oil, lower cost for oil replacement
- Significantly lower downtime for periodical checks
- Virtually maintenance free
- Servo driven toggle

THE MOST ADVANCED MOLD PROTECTION SYSTEM AVAILABLE ON THE MARKET.

SIPA's automatic mold protection system is very sensitive and also very fast in stopping the clamp' closing. During mold closing, the controller measures the closing force (or clamp speed) and compares it with values stored during a "teach in" phase. If there is a deviation outside a preset tolerance, the system stops the machine. Measurements are performed every single cycle, so increased mold life is assured.

Two sizes of extruder are available for XFORM

- New XFlow™ screw design for increased throughput and wide process window

Features and benefits of the injection system

- Servo-driven
- Continuous low-speed screw rotation:
  - no power peaks for screw restart, lower energy consumption
  - lower stress on the material
  - lower AA generated by the extruder
- Possibility to use colour up to 4% with NO throughput drop
- 3 shooting pot designs
- 2 screw designs:
  - 120 mm
  - 140 mm

UP TO 100% rPET PELLETS CAN BE USED, WITHOUT ANY MODIFICATIONS TO THE STANDARD PLASTICIZATION GROUP

POST-MOLD COOLING SYSTEM: FAST AND COMPATIBLE

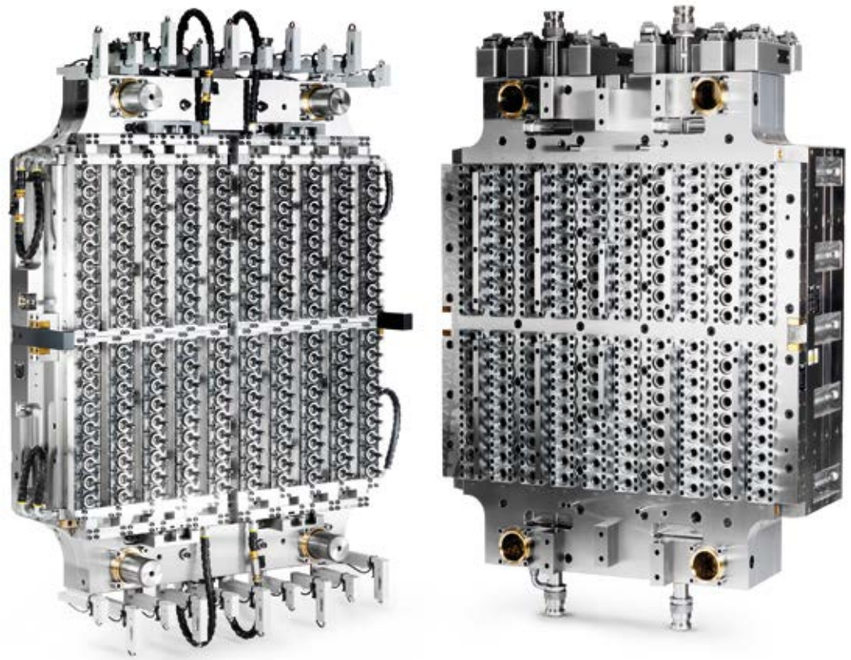
XFORM GEN4 features a post-mold cooling system which delivers unprecedented cooling efficiency and unique flexibility. The EOAT features up to 4 cooling stages for 30mm-neck preforms; legacy EOAT can also be installed on the GEN4 PMC systems.

The post-mold cooling system features internal preform cooling through vacuum, thus generating an airflow through the neck first and then through the body: this eliminates the air temperature increase typical of competitor' system, which blows air directly into the hottest part of the preform, the gate area. The vacuum box is independent from the clamp movement, allowing for better reliability and greater flexibility in setting different process times.

Features & Benefits of the PMC

- Very efficient neck finish and preform body cooling
- Up to 4 cooling stages
- Can accept legacy EOAT
- 3 shooting pot designs
- Independent form clamp movement
- Better accessibility of the non-operator side

PREFORM MOLDS: ENGINEERED FOR LONGLIFE



SIPA, the world's second-largest preform tooling supplier, produces in-house 100% of hot runner manifolds, heaters, plates and stacks with complete inspection of all the components. As a result, customers gain full benefit from numerous technological features the company has developed.

SIPA GEN4 hot runner systems deliver:

- **XActive-Cleaning** solution cuts dust in pet preform hot runner systems, thanks to two different dedicated circuits it prevents preform quality issues caused by blocked pistons
- Up to 5 million cycles without maintenance (low powder formation)
- Best in class balancing and low pressure drop
- Increased injection speed, shorter cycle time
- Optimal preform weight distribution
- Extremely low PET degradation and dead spots (low AA levels)
- Easy maintenance: the whole circuit is cleaned up at every cycle and there are not unexpected stops for dust removal

SIPA GEN4 cold half systems deliver:

- 11 million maintenance-free life cycles guaranteed (flash < 0.2 mm) without need of components refurbishing thanks to the LongLife™ treatment
- Significantly reduced refurbishment costs
- Optimal cooling to maximize productivity with high quality preform
- Stronger mold structure with less deformation, better precision and higher reliability
- Proprietary XMould™ technology
- Proprietary LongLife™ technology

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