

## SMARTSTACK DESIGN CROWNS A DECADE OF DEVELOPMENT



### TECHNICAL WINDOW - SMARTSTACK

When SIPA set out to develop its new SmartStack design for PET preform mold stacks, it wanted to build on all the important developments that have taken place over the last 10 years in stack design. The goal was to provide all the following features in a single design:

- Excellent preform quality
- Long lifetime without refurbishing
- Use of standard parts
- Good cooling performance
- Low cost for conversion when necessary
- Corrosion resistance
- Low water requirement
- Excellent demolding behavior
- Simple maintenance procedures
- Superior air vent solutions
- No flash
- Low clamp tonnage requirements
- Very low part weight deviation

#### EXCELLENT PREFORM QUALITY

The molding surface tolerances and alignment features that SIPA applies to its stack components result in a preform where the split lines between the different mold components are nearly invisible.

#### LONG LIFETIME WITHOUT REFURBISHING

Large taper selections made during the design phase ensure that the stack components generally exceed expectations. The taper length is directly proportional to the lifetime of an injection molding stack, since the longer the taper, the lower the stress applied during the injection phase.

#### STANDARD PARTS

The SIPA stack design and the locations of the split lines mean that only three preform design-related stack parts are required – half as many as in other designs. The locking ring, cavity flange and even the neck ring can all be regarded as standard parts, since it is possible to use them for various different preform designs. Only the cavity, gate insert and core are unique to each individual preform design.



**GOOD COOLING PERFORMANCE**

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**LOW CONVERSION COSTS**

Thanks to the perfect positioning of the split line, use of the SIPA SmartStack makes it possible to build a mold insert for a new preform design or weight by producing only a minimal number of new stack parts. This means that the customer spends less money to achieve their goal.

**CORROSION RESISTANCE**

SIPA's selection of special steel grades makes the stack parts corrosion resistant and helps to ensure that the parts achieve a long lifetime without having any cracking issues or surface pitting due to cor-

rosion. In special cases, SIPA even adds special coatings to improve resistance against aggressive media.

**LOW WATER REQUIREMENT**

The cooling channel layout in the SIPA SmartStack design, together with features that increase turbulent flow, reduces the amount of cooling water needed to achieve excellent heat transfer capabilities. This results in a reduced energy requirement for SIPA preform molds.

**EXCELLENT DEMOLDING BEHAVIOR**

The dedicated surface preparation on SIPA SmartStacks makes sure that preform demolding is very easy and does not impact on either cycle time or preform quality. Specific methods are applied to achieve this performing behavior, with each surface preparation selected according to the particular preform design or customer specification.

**SIMPLE MAINTENANCE PROCEDURES**

SIPA stack parts are designed to align with each other using simple

features that are applied to each element. This makes sure that wear on stack parts is low and the preform split line quality is perfect. Due to these features, maintenance procedures can be carried out very quickly and with little risk of error.

**SUPERIOR AIR VENT SOLUTIONS**

Components in the SmartStack have large air vent surfaces to ensure that filling is fast and the interval between cleaning cycles is as long as possible. SIPA has the largest air vent solutions available on PET injection molding stacks.

**NO FLASH**

An embedded TSS (Top Sealing Surface ) in the SmartStack core design eliminates the sorts of TSS issues found on many other tools. An important benefit is improved sealing performance for the cap.

**LOW CLAMP TONNAGE REQUIREMENTS**

SIPA's neck ring design minimizes the clamp tonnage requirements on the SmartStack. By minimizing the molding surface inside the neck ring and so reducing the force

applied to the neck ring, lifetime is extended and cooling requirements reduced.

**VERY LOW WEIGHT DEVIATION**

With the tight manufacturing tolerances applied to SIPA SmartStack stack parts, as well as the company's superior hot runner technology, it is possible to achieve very low weight variations within a complete set of preforms produced during any one shot. This enables SIPA preform producing customers to reduce their target weight to very close to the minimum in the specification.

**IN CONCLUSION**

All these features together in the SmartStack add up to a design with multiple advantages over existing solutions on the market. SIPA is faithful to the classical toolmaker approach, checking every project for its specific needs.

