



IPS

Injection Preform System
瓶坯注塑成型设备

A reliable, effective solution for TCO optimisation. Sustainability and circular economy performance thanks to outstanding material management.

可靠高效总成本优化解决方案, 源自卓越的物料管理系统。可持续发展和循环经济新机械时代, 悄然来临。



SACMI

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THIS TRIED AND TESTED SACMI PLATFORM WITH INJECTION TECHNOLOGY ALLOWS PREFORMS TO BE MANUFACTURED WITH EVER-MORE SUSTAINABLE PROCESSES AND MATERIALS.

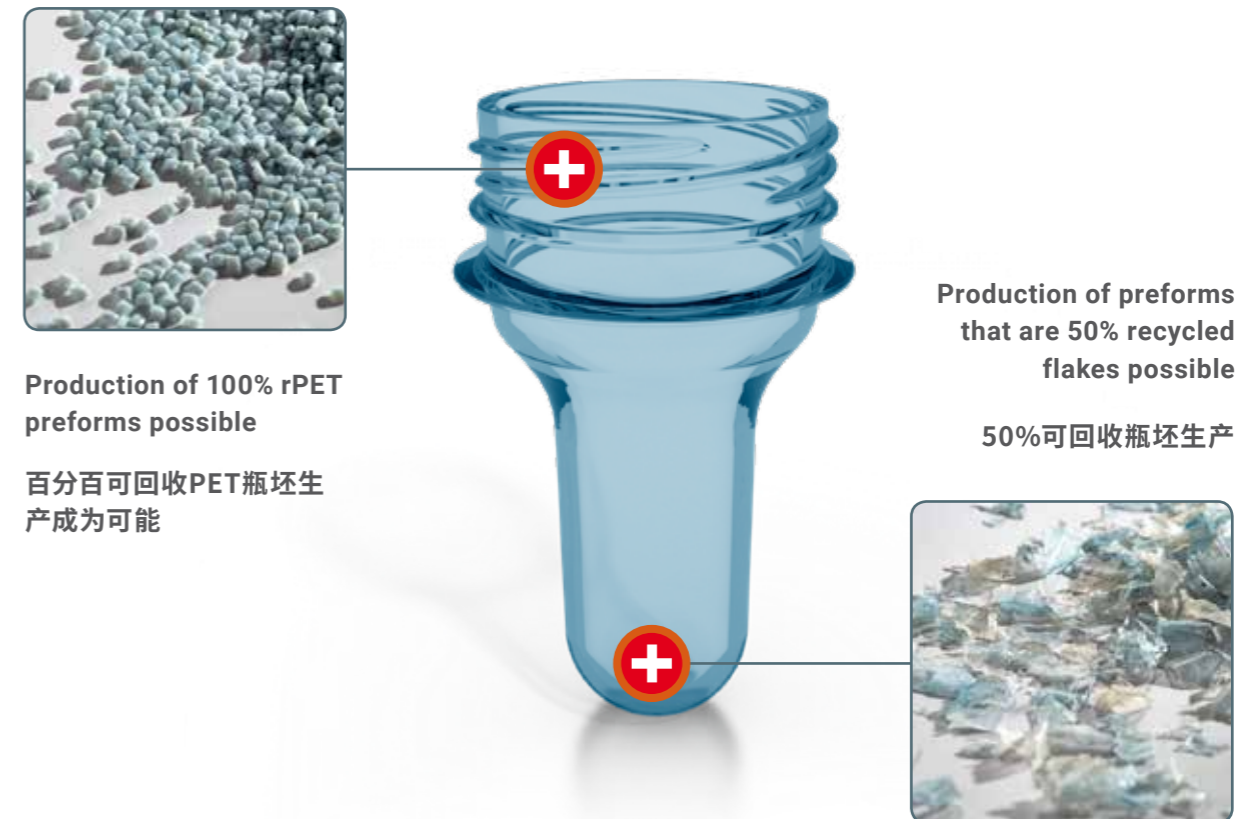
萨克米瓶坯注塑成型设备经优化和改良，不仅完全适用于可回收材料，在整个加工过程中更有利于可持续生产和循环经济的发展。

EU Directive 2019/04 prohibiting single-use plastics is set to revolutionise the industry by 2025. The world's main FMCG (Fast Moving Consumer Goods) makers have already signed the document drawn up by the Ellen MacArthur Foundation – a leading international non-profit association that advocates the establishment of a circular economy – and committed to reducing the amount of virgin material in packaging and increasing returnable PET quotas.

一次性塑料欧盟法令于2019年4月正式颁布，对一次性塑料说不将为整个塑料行业带来变革，此项计划预计至2025年完全解决一次性塑料问题。艾伦麦克阿瑟基金会(Ellen MacArthur Foundation)是一家以发展和倡导循环经济为主的非赢利协会，该基金会起草并向全球包装领域发出关于减少一次性塑料的使用和推广可回收PET原料的请愿书已由多家制造签署。

The IPS can be used to make rPET preforms and can use recycled PET in flake form in quantities of up to 50% using standard machines and hot runners. Yet another revolution for an industry that, until now, was almost exclusively focused on lightweighting.

标准型瓶坯注塑成型设备和普通版热流道适用于50%可回收PET料，升级优化版瓶坯注塑成型设备可完全适用于可回收PET料。全新应用不仅使瓶坯生产设备更符合市场需要也为生产厂商提供产品轻量化解决方案。



100% recyclable, PET is becoming pivotal to the plastics industry on account of intrinsic advantages with respect to other plastic materials: these include both re-usability and a versatility that makes it suitable for all kinds of industrial packaging.

与其它塑料相比，PET在塑料行业内至关重要，除百分百可回收之外，其灵活性能在包装行业内深受好评。

SACMI has set itself the goal of giving PET a 'second life' via the use of recycled resins and/or by aiding full re-use of the material as per circular economy precepts.

可回收和再生原料的充分利用不仅有利于循环经济良性发展，也使PET原料在饮料包装市场上发挥举足轻重的作用。

SACMI LAB

Comprehensive assistance

SACMI PROVIDES ALL-ROUND ASSISTANCE SERVICES, FROM CLOSE SUPPORT DURING DEFINITION OF PACKAGING DESIGN CRITERIA TO MOULD-MAKING, FROM COMPLETE PLANTS TO QUALITY CONTROL DEVICES.

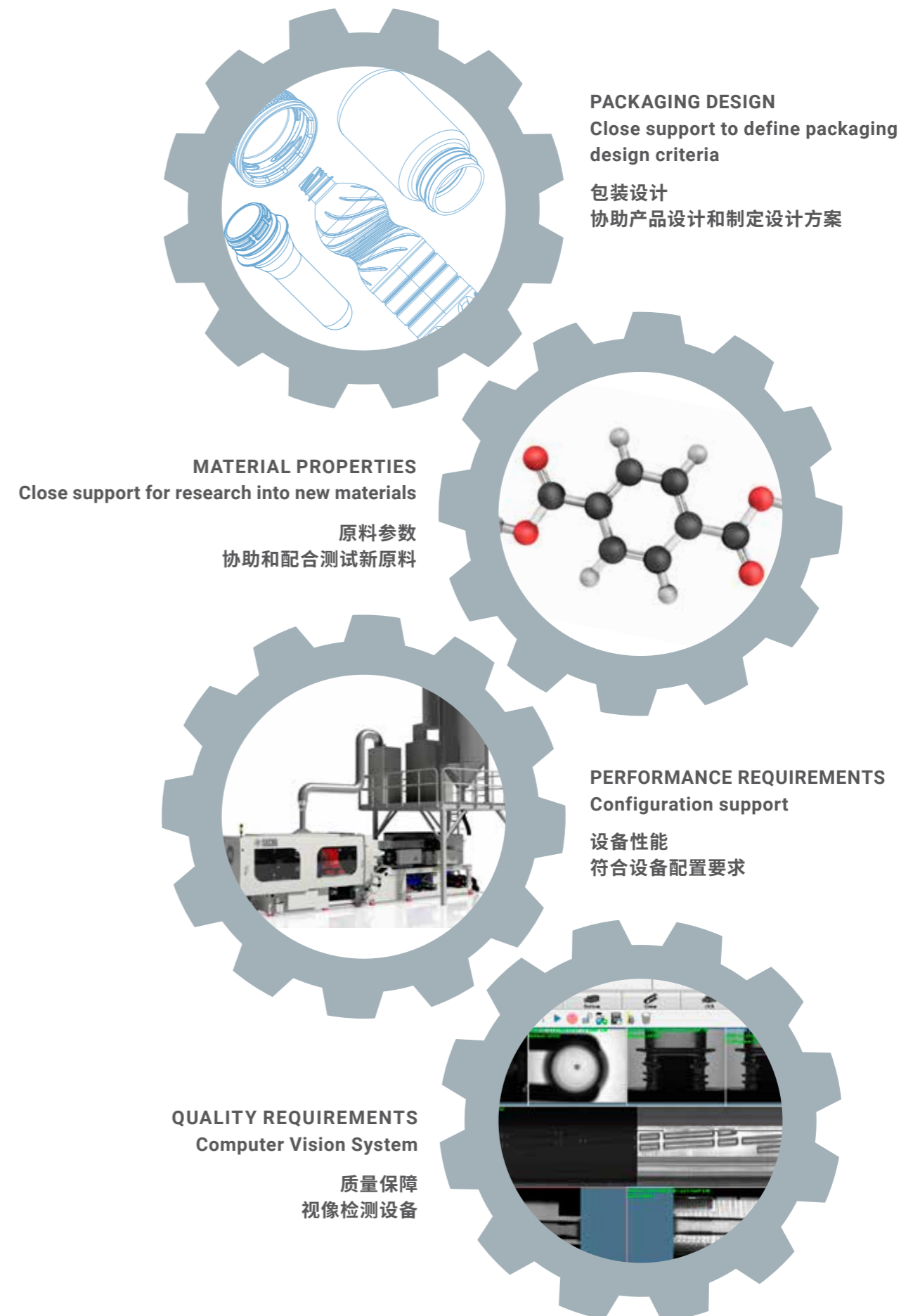
Being able to count on a sole provider of all the technologies involved in the beverage production process is now seen by the world's major companies as an essential competitive advantage. At present SACMI is the only supplier of systems and solutions to the beverage industry that has developed proprietary technology for each key stage of the production process. The SACMI Laboratory draws on decades of experience and is equipped with cutting-edge material testing machines, calculation tools and production simulation equipment; it develops, in close collaboration with customers, innovative packaging of exclusive design, a must when it comes to responding to the needs of an ever-more competitive market in which producers continuously need to reduce material weight and costs.

萨克米研发中心 - 全面支持

从设计标准到制模，从生产线解决方案到产品质量控制，萨克米提供全方位的个性化定制式服务。

全球几大饮料公司现已得知，萨克米拥有最主要的竞争优势是各项技术能成功涵盖饮料生产加工的方方面面。萨克米研发产品加工过程各阶段专有技术，是唯一一家供应商提供成套完整的饮料生产线。

萨克米实验室专注于容器研发，采用尖端实验设备测试原料，评估模具，生产模拟，积累了几十年丰富经验。与客户紧密合作，为减少原料重量和降低成本不断努力。保持创新，独家设计，满足客户需要同时，使产品更具说服力，及时有效应对竞争激烈的饮料市场。



INTEGRATED PVS SYSTEM

For real-time monitoring of 100% of production

与瓶坯视像检测设备连线

实时监督产品质量

CLAMPING UNIT

High performance toggle solution with
< 2.1 sec. lock-to-lock

锁模单元

高性能肘臂解决方案, 锁模时间< 2.1秒

PLASTIFICATION AND INJECTION UNIT

State-of-the-art solution for wide range of PET resins
including rPET with up to 50% flakes

塑化和注塑单元

适用于各类PET原料, 包括可回收PET和50%可回收PET料。

HMI & AUTOMATION

Innovative software ensures a user-friendly system with
perfect process control.

人机界面及自动化

先进的软件操作系统简单易用, 对加工过程准确和有效控制。

Strengths

优势

QUALITY, PERFORMANCE, SUSTAINABILITY: FEATURES THAT MAKE THE INJECTION PREFORM SYSTEM UNIQUE COMPARED TO OTHER TECHNOLOGIES.

高效、优质、可持续性是全瓶坯注塑成型设备的特点

QUALITY

- 100% of output inspected on the line at up to 70,000 pph
- Highly accurate control and detection of number of cavities

优质

- 瓶坯检测速度达到70,000 pph
- 精确控制和模腔准确识别

PERFORMANCE, FLEXIBILITY, RELIABILITY

- High performance and lock-to-lock of less than 2.1 sec
- Fast mould changeover and compatibility with existing moulds
- Outstanding component reliability means excellent plant reliability

高效、灵活、可靠

- 高效, 锁模时间少于2.1秒
- 更换模具快速, 设备与现有模具兼容
- 部件可靠生产为工厂生产加工提供保障



USER FRIENDLINESS

- Simplification of process parameters
- Fast learning curve for workers
- Easy low-cost maintenance with spacious access points

操作简单

- 加工参数简化
- 易学易用, 操作简单
- 维护成本较低

SUSTAINABILITY

- Can be used in standard configuration with 50% rPET and 50% flakes
- Lowest energy consumption on the market thanks to balanced hydraulic system and use of K.E.R.S. in robot extraction.

可持续性

- 标准配置适用于50%可回收PET和新PET原料
- 液压平衡系统和能源回收系统能有效节省能源。

Clamping unit

合模单元

ULTRA-FAST LOCK-TO-LOCK TIMES,
REDUCED PREFORM CYCLE TIME.

锁模时间越短，瓶坯生产的循环时间也就越短。



The toggle system and moving platen that make up the mould clamping unit have been designed using FEM structural analysis to optimise mechanical inertia and ensure excellent resistance to mechanical stress.

采用有限元结构分析方法，优化机械惯性和确保机械应力受阻性能优越，曲轴单元与动模板组成合模单元，

On the 220 ton version the preform stripper plate is controlled by two hydraulic cylinders: one for preform release, the other for extraction. This solution optimises the ejecting force, ensuring significant energy savings.

220型瓶坯注塑系统的脱坯盘由两个液压气缸驱动，一个用于开模，另一个用于抓取瓶坯，其优点在于优化脱模力，节能效果显著。

On the 400 ton version ejection is once again a two-stage process: release by way of boosters sunk into the moving platen and ejection by bars guided by 2 cylinders located in the rear of

the moving platen. All hydraulic actuators are equipped with customised digital servo-valves located in the immediate vicinity.

400型则是采用两步法完成，经助推器下降至推板，推板后方的两个气缸控制并执行脱坯。所有液压驱动都由邻近的数码伺服阀控制，减少注塑周期，降低瓶坯循环时间。

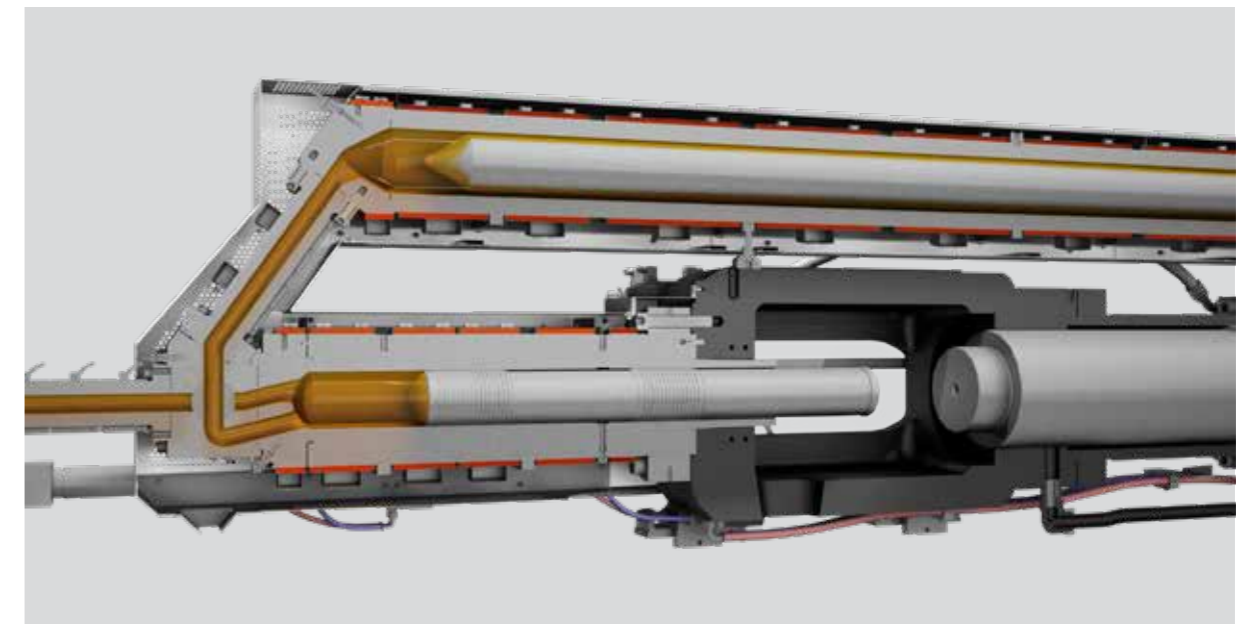
This guarantees ultra-fast lock-to-lock times, thus reducing the preform cycle time.

Injection unit

注塑单元

HIGH PERFORMANCE AND
ENERGY SAVINGS

高效和节能



The injection unit consists of an extruder with an electrical-drive plasticizing screw and a shooting pot controlled by servo valve. This solution ensures high performance and energy savings.

注塑单元包括一个装有电子塑化螺杆的挤出机，以及一个伺服阀控制的注射腔。该解决方案确保设备的高性能的同时还达到节能的效果。

With the standard extrusion configuration it's possible to produce preforms with 100% recycled material of which 50% can be flakes.

标准挤出配置适用于可回收原料和50%可回收料。

SACMI moulds for PET preforms

WITH 30 YEARS OF EXPERIENCE AND 15,000 STACKS A YEAR, SACMI IS THE WORLD'S LEADING PRODUCER OF MOULDS FOR THE BEVERAGE INDUSTRY.

Product design, mould development and direct testing on SACMI machines ensure an all-round service of unrivalled quality.

SACMI moulds begin their lives with precision in-house design of each individual component. The design process is as innovative as it is sophisticated.

Meticulous care goes into every aspect of design, especially the SACMI-developed hot runners with optimised flows that minimise both the energy required by the heater elements (thus reducing power consumption) and the PET degradation that can generate acetaldehyde.

High-efficiency cooling circuits for the stacks ensure outstanding heat exchange efficiency, resulting in particularly high-performance production cycles.

萨克米PET瓶坯模具

超过30年生产经验，每年生产15,000个模腔，在饮料行业，萨克米模具生产技术全球领先。

从产品设计到模具研发，再到模具测试，萨克米为客户提供优质高效的服务。

萨克米模具设计之初就运用创新、精湛的工艺设计每个部件。

萨克米秉持一丝不苟的设计理念来为每个部件进行设计，通过优化流速将热能量的供应降至最低，从而减少功率消耗、PET降解和乙醛的产生。

高效冷却回路实现高水平的热交换效率，从而带来高性能的生产循环。



SACMI's mould manufacturing department produces thousands of injection and compression mould cavities each year; it does so by using only the highest quality materials, carrying out precision machining and running computerised checks on the entire production cycle.

萨克米模具生产部门每年生产上千件注塑和压塑模具，只使用最好质量的材料，而且在整个生产循环过程中，进行高精度制作打磨，采用计算机化的检测程序。



Post-cooling unit with KERS

MAXIMUM QUALITY AND REPEATABILITY, SPEED AND SAFETY.

The post-cooling unit is fully integrated on the machine and consists of a 3 or 4 stations. Two solutions are available to remove preforms from the station:

- vacuum cups
- pneumatic grippers with food-grade silicon seals

The thus-designed system eliminates the risks associated with the handling of warm preforms.

The take-out robot is driven by latest-generation belt-free (and, therefore, maintenance-free) linear motors, ensuring accuracy, speed and repeatability of robot movements.

To save energy, a braking energy recovery system (K.E.R.S.) has been installed; this works during deceleration of the motors.

后冷却单元配备能源回收系统

优质、高速、安全

后冷却单元可与设备完全整合，包括3或4站式拾取装置。

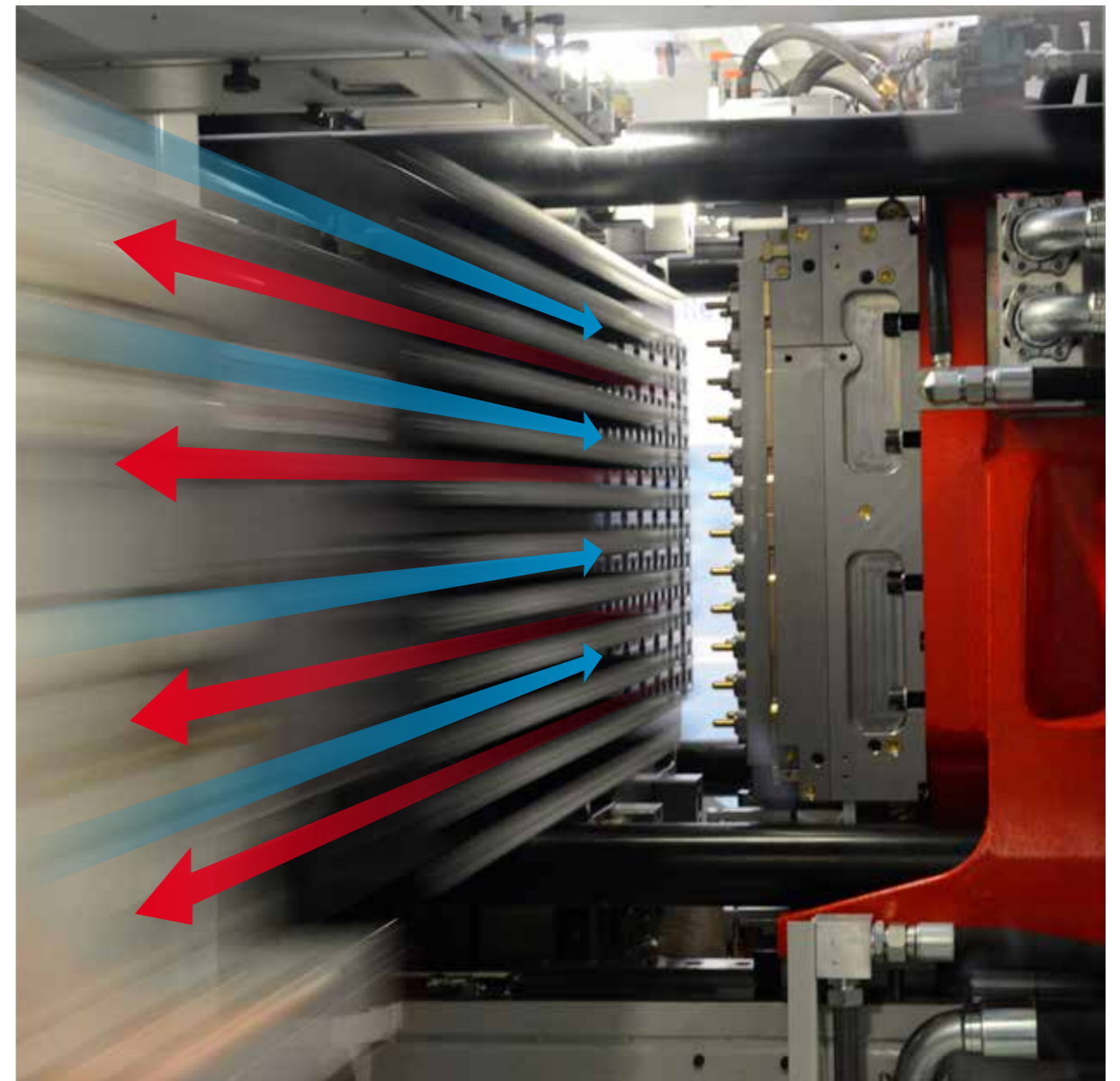
取坯可以采用两种方法，

- 真空吸杯
- 食品级硅胶取坯装置

该系统的应用可确保在处理热瓶坯时质量以及安全性得到保障，规避风险。

抓坯机械手由高性能线性马达驱动，以确保机器运动高精度，高速度，与稳定性。

能源回收系统在马达减速时开始运行。



While, on the 220 ton version, the preforms are unloaded by the placer onto traditional T belts (also integrated on the machine), on the 400 ton version the two containers (octabins) are positioned inside the booth and the placer releases the preforms directly inside them. Another feature, installed throughout the range, is a preform sampling system, activated by the machine operator as required.

IPS220设备上，瓶坯输出至传统T型皮带上（皮带与机器整合），而IPS400设备，存放区域经内部定位，瓶坯直接被输出。

萨克米注塑系统的另一特点是瓶坯取样系统，设备操作者可根据需求启动该系统。

IPS flexible solutions

DIFFERENT, OPTIMIZED SOLUTIONS HAVE BEEN DEVELOPED ACCORDING TO SYSTEM SIZE IN ORDER TO ENHANCE FLEXIBILITY.

The 220 ton platform features a hydraulic/pneumatic mould connection system, integrated in the fixed and moving platens. There is also a quick-lock system, which forms a sort of 'plug-and-play' system during size changeovers.

On the 220 ton platform there is also an automatic system to drain cooling liquid from the mould; this ensures there is no leakage during disassembly and that moulds are stored without any liquid left inside them.

The 400 ton platform, instead, features a somewhat different flexibility concept as this is a size not normally intended for frequent production changeovers. On this platform, then, the approach to mould interchangeability lets customers use competitor-supplied moulds already in their possession on the IPS400 too.

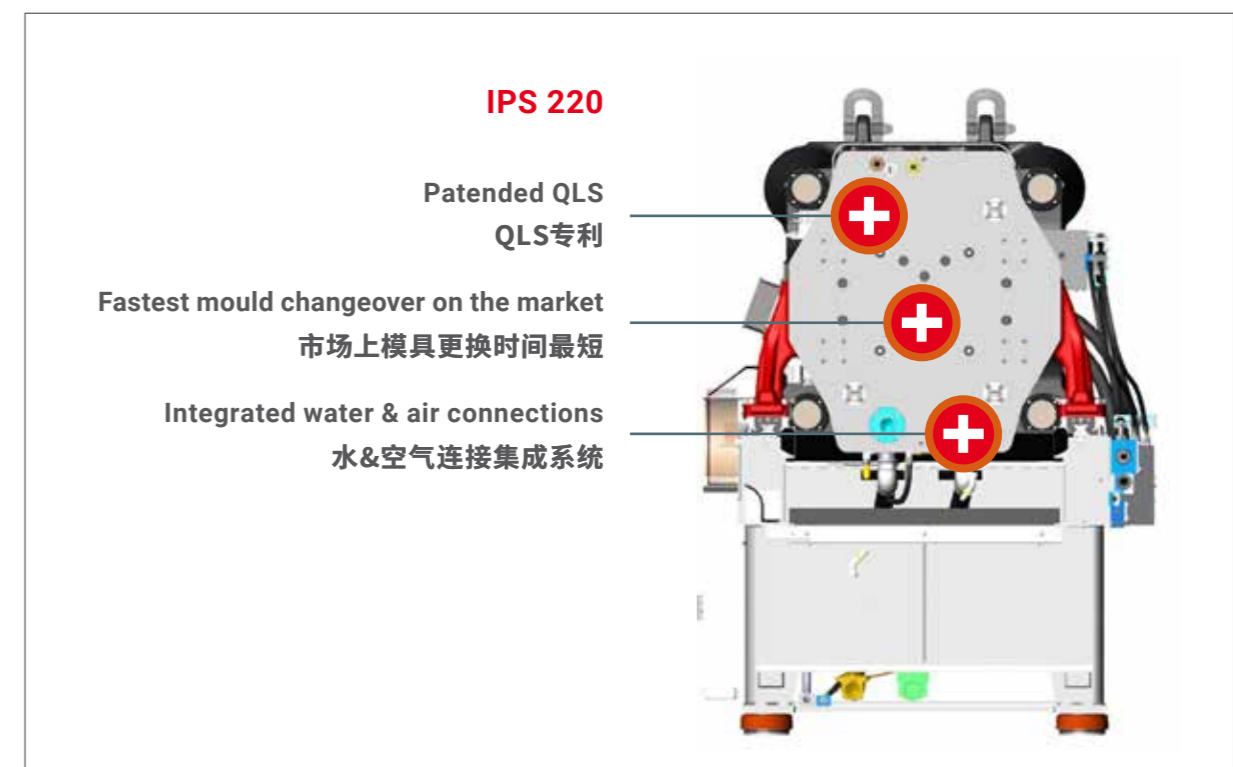
灵活的注塑机解决方案

为了提高灵活性，萨克米根据系统开发了不同的优化方案。

IPS220配有液压/气动模具连接系统，并安装在固定和可移动面板上。快速锁模单元由一个“即插即用”系统组成，以利于更改产品尺寸。

IPS220平台上装有一个自动化排水系统，可以将模具上的冷却水排出；这一系统确保了模具拆卸时不会漏水以及，模具储存时不会有液体残留。

灵活性的概念在IPS400的应用与IPS220不同，IPS400由于尺寸所限不适用频繁更换。在平台上，客户可使用其它制造商的模具来替换现有模具。



In this case, hydraulic and pneumatic interfacing is of the traditional type with external piping.

液压气动的界面是传统型，带有外部管道系统。

Human Machine Interface

人机界面

SIMPLIFICATION OF PROCESS PARAMETERS FOR FAST MANAGEMENT BY WORKERS.

人机界面简化工艺参数，方便操作者快速管理。

Special SACMI-developed PET preform production software renders the user interface extremely simple, letting producers configure the machine simply by entering preform dimensions and thickness.

萨克米研发的PET瓶坯生产人机操作界面非常易操作，生产者可通过输入瓶坯规格及厚度来进行瓶坯生产。

This user-friendly solution allows easy parameter settings, with the advantage that the machine no longer needs to be run by a highly specialised worker.

人机界面已操作的特性最大的优势是无需由高级别的操作工进行操作。

All auxiliary systems are also controlled via the operator panel.

通过操作面板也可控制辅助系统。



MAIN TECHNICAL DATA

主要技术指标

DIMENSIONS / 规格	IPS220	IPS400	
General / 综合数据			
Overall length (mm) / 总长度(毫米)	11373	11914	
Overall width (mm) / 总宽度(毫米)	3592	4571	
Floor space (m ²) / 占地面积(平方米)	40	54.5	
Mould weight (kg) / 模具重量(千克)	2500	5600-6300	
Total weight (kg) / 总重(千克)	30400	55800	
Oil tank capacity (l) / 油缸容量(升)	1000	1650	
Clamping Unit / 合模单元			
Clamp force (kN) / 合模力(kN)	2200	4000	
Tiebar spacing HxV (mm) / 拉杆间距HxV(毫米)	720x718	1125x932	
Working opening strokes (mm) / 开模冲程(毫米)	429-502	440-520	
Max mould height regulation (mm) / 模具可调节最高(毫米)	745	800	
Min mould height regulation (mm) / 模具可调节最低(毫米)	505	590	
Max ejector stroke (mm) / 脱模最大冲程(毫米)	190	190	
Lock-to-lock (s) / 锁模时间(秒)	2.1	2.1	
Injection Unit / 注塑单元			
Screw diameter (mm) / 螺杆直径(毫米)	100	120	140
Screw L/D ratio / 螺杆长度/直径比	25	25	25
Nominal screw productivity (kg/h) / 螺杆额定产能(kg/h)	625	900	1225
Shooting pot diameter (mm) / 注射腔直径(毫米)	95	105	120
Max shot weight (g) / 最大注塑量(g)	2880	5760	5760
Post cooling & unloading / 后冷却&瓶坯输出			
Take out plate post cooling stations / 取坯板后冷却站数量	3	3 or 4	
Take out plate drive system / 取坯驱动系统	belt-free linear motor / 无皮带线性马达	belt-free linear motor / 无皮带线性马达	
Gripper plate / 夹取板	2 axis / 双轴	3 axis / 3轴	
Unloading system / 输出系统	gripper drops on T-belts / 夹取后放置于T型皮带	gripper drops into cartons / 夹取后放置于纸箱内	

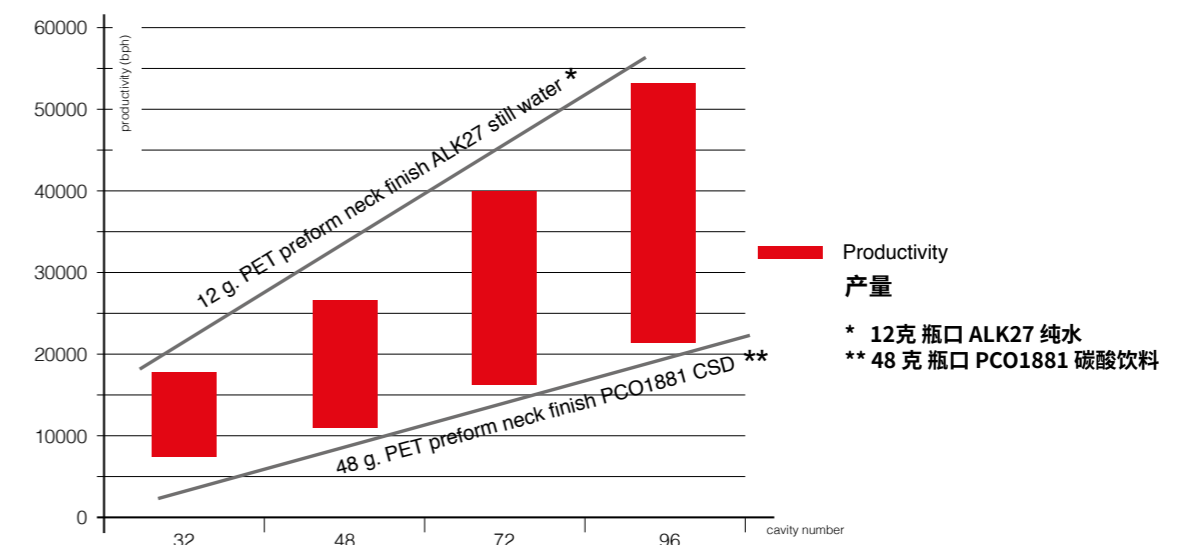
PREFORM MOULD MATRIX

生产率统计表

Preform mould matrix / 注塑机类型						
Machine / 机器	cavities / 模腔数	cavity pitch vertical x horizontal / 模腔节距垂直x水平	Post cooling positions / 后冷却位置	Max neck / 瓶颈最大	Max length (mm) / 瓶坯最长(毫米)	Max weight (g) / 最大重量(克)
IPS220	72	50 x 120	3	29/25	130	45
	48	50 x 140	3	30/25	160	60
	48	60 x 152	3	Bericap 38 百利盖38	160	60
	32	60 x 152	3	Bericap 38 百利盖38	160	60
	24	80 x 180	3	PCF43	195	100
	16	80 x 180	3	Bericap 48 百利盖48	195	
IPS400	128	50 x 111	3	30/25	160	45
	96	50 x 140	3	30/25	160	60
			4	30/25	140	60
	96	50 x 155	4	30/25	160	60
	96	60 x 140	3	Bericap 38 百利盖38	160	60
	72	60 x 152	3	Bericap 38 百利盖38	195	80
	48	80 x 180	3	PCF43	195	140
	32	80 x 180	3	Bericap 48 百利盖48	195	140

PRODUCTIVITY TABLE

生产率统计表



Inspection Systems

IN-LINE PREFORM INSPECTION
UP TO 70,000 PPH.

SACMI provides a wide range of preform quality control machines with stand-alone check and sampling systems plus integrated in-line systems for real-time monitoring of plant performance.

To improve tried-and-tested artificial vision technology further SACMI has fielded new patented technologies that combine the use of polarised light with advanced AI algorithms to give every single preform guaranteed quality.

视像检测设备

瓶坯在线检测
检测速度高达70,000瓶/时

萨克米提供全方位的质量控制检测系统, 独立式的检测抽样系统与在线系统整合, 可以实时监测工厂设备运行情况。

萨克米全新专利将偏振光与先进的人工智能结合, 可以给每一个瓶坯更高的质量保证, 更进一步提升了视觉检测系统的性能。



SACMI reserves the right to introduce changes without notice / 30.09.2019
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