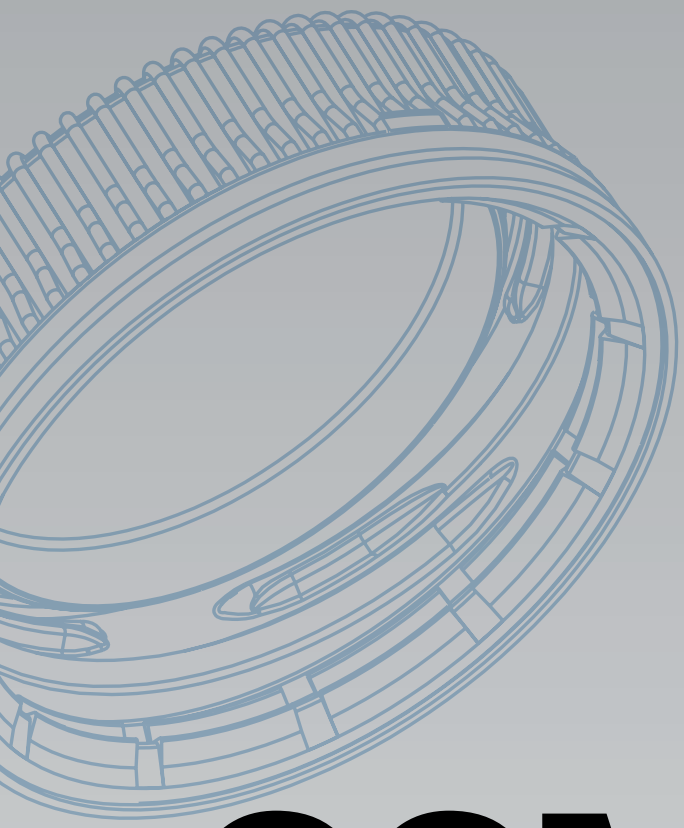
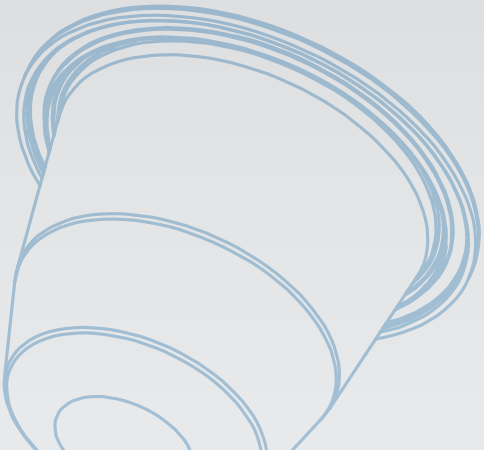


CCMM™

Continuous Compression Moulding Multilayer
多层连续压塑成型技术

The advantages of continuous compression for the most technologically advanced multilayer solution

连续压塑成型工艺创新突破，多层压塑技术成为可能



SACMI

ENDLESS INNOVATION SINCE 1919

CCMM™

Compression goes multilayer

多层压塑技术

CCMM COMBINES THE ADVANTAGES OF SACMI COMPRESSION WITH A REDUCTION IN THE USED QUANTITIES OF VIRGIN MATERIAL, KEEPING MANUFACTURERS AHEAD OF NEW STANDARDS AND MARKET TRENDS

萨克米多层连续压塑成型技术在原有基础上继续研发，整合压塑特点和优势，节省成本与降低能耗，不断刷新行业标准，引领机械新风尚，尽在萨克米智造

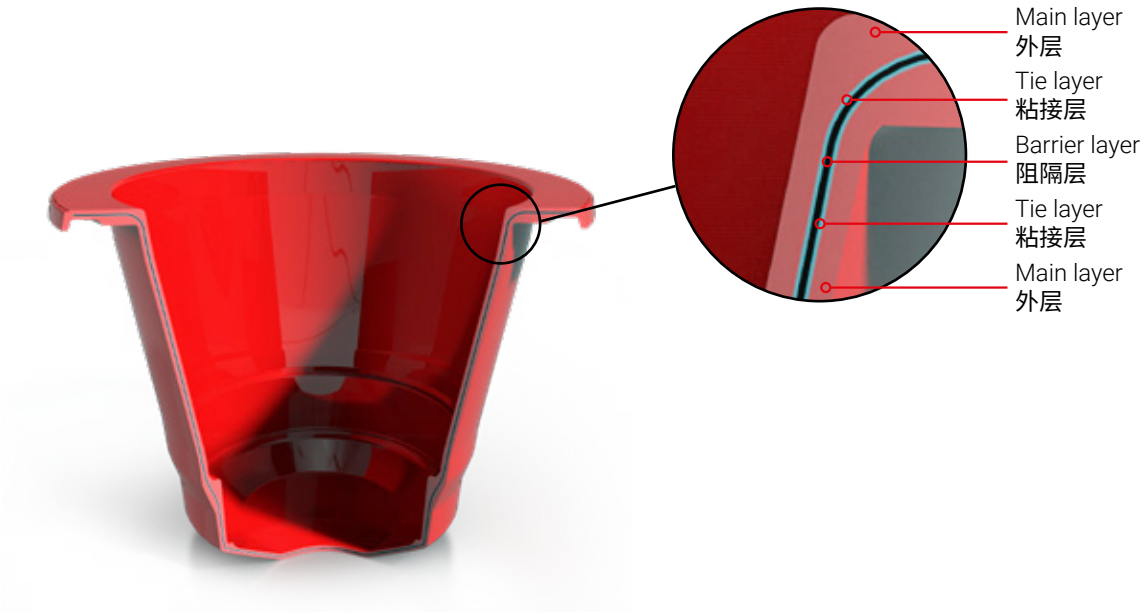
Multilayer represents the cutting edge of SACMI compression technology for the manufacture of capsules with high barrier performance. CCMM combines all the advantages of compression with the creation of a high performance multilayer solution. This results in a reduction in the amount of virgin base material used in the process (keeping manufacturers ahead of any changes in standards) and optimisation of barrier material and binder quantities while obtaining an exceptional barrier effect.

多层压塑技术展现了萨克米压塑技术的先进优势，是制造高阻隔胶囊的关键技术。

多层连续压塑成型技术结合了压塑工艺的所有优点，创建了高性能的多层解决方案。
这一技术的应用减少了生产过程中的原材料消耗（制造商将领先于行业标准），降低阻隔原料和粘接剂的使用量的同时确保性能。

UP TO 5 LAYERS
OPTIMISED TIE LAYER

5层咖啡胶囊
粘接层优化



PERFECT PROTECTION OF THE AROMA

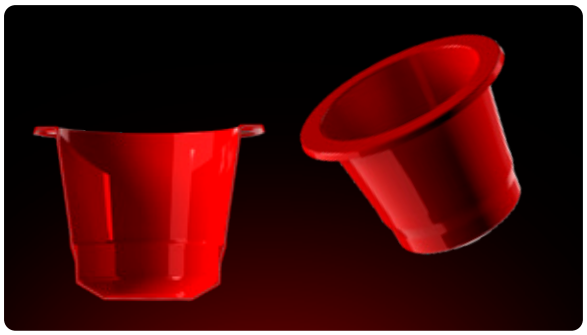
CCMM-made capsules have exceptional barrier properties thanks to the fact that the barrier material layer, which can be made of different materials according to specific finished product requirements, is distributed throughout the product to provide a continuous, consistent layer.

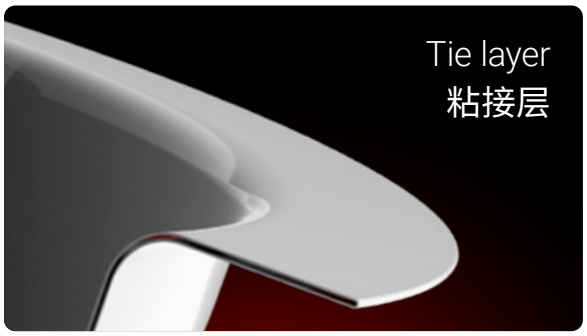
The employed extrusion process allows layer creation (from 3 to n layers) with real-time modulation of the various characteristics of the layer itself to meet the performance requirements of the product being made.

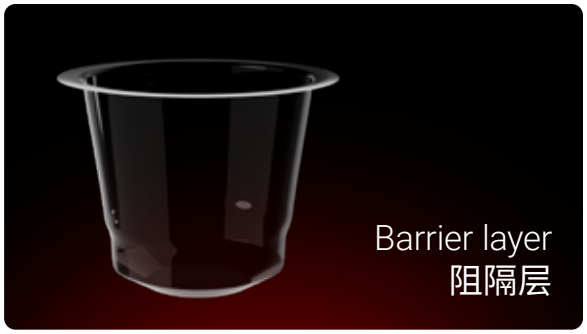
咖啡浓郁香味完好保留

多层连续压塑成型技术生产的咖啡胶囊具有特殊阻隔性能，原因是阻隔材料层可以根据成品要求选取相应的材料，材料分布于咖啡胶囊中形成均匀一致的胶囊层。

挤出工艺的应用可根据产品性能要求，对胶囊层（3层到n层）实时调整使其满足产品要求和特性。







PERFECT TIE LAYER CONTROL

Compared to alternative technologies, tie layer control is highly optimised. As the doses are formed, continuous compression technology produces tie layers designed to bind the main material with the barrier layer. In other words, with the CCMM the tie layer is not mixed in with the main material because it has its own dedicated extrusion system. What's more, this ensures manufacturers only use the quantity of tie layer that is strictly necessary.

精确控制粘接层

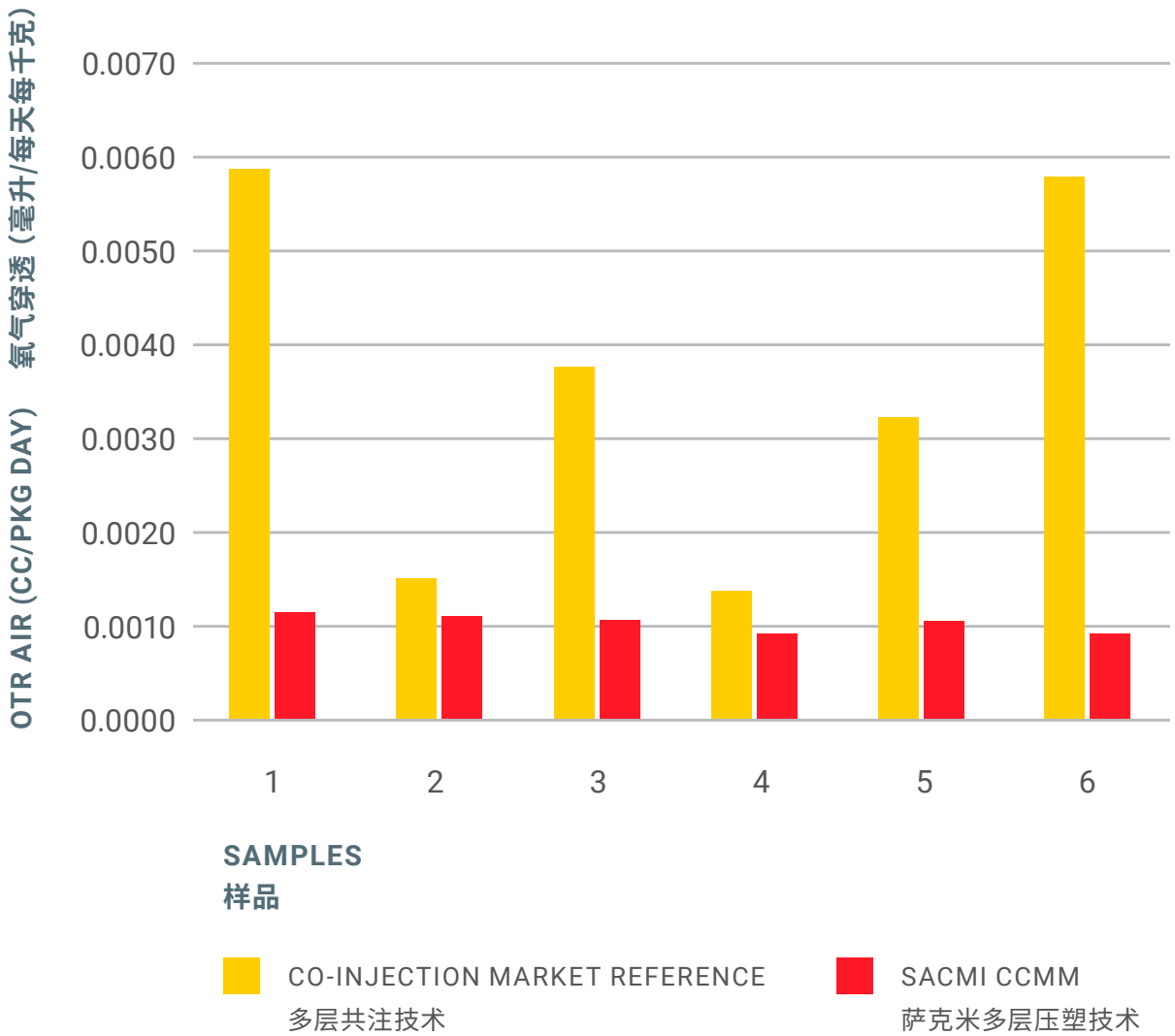
与其他技术相比，采用压塑工艺生产的咖啡胶囊粘接层使产品得到进一步优化。伴随着剂量的注入，连续压塑生产的粘接层用于将主要材料与阻隔层结合。

换而言之，采用多层连续压塑技术，粘接层无需与外部主要材料互相混合，它具有专属的挤出系统。不仅如此，这一特性使制造商只需要使用一定数量的粘接层原料即可完成生产。

BARRIER PROPERTIES COMPARISON

阻隔性能对比

K-CUP®



CCMM™

1. MULTIPLE EXTRUDERS
With volumetric pumps, to melt different materials

2. TRANSFER SYSTEMS
Cut, transport and insert a precise plastic multilayer dose into the mould

3. CO-EXTRUSION BLOCK
For precise alignment of molten material in a defined continuous multilayer flow

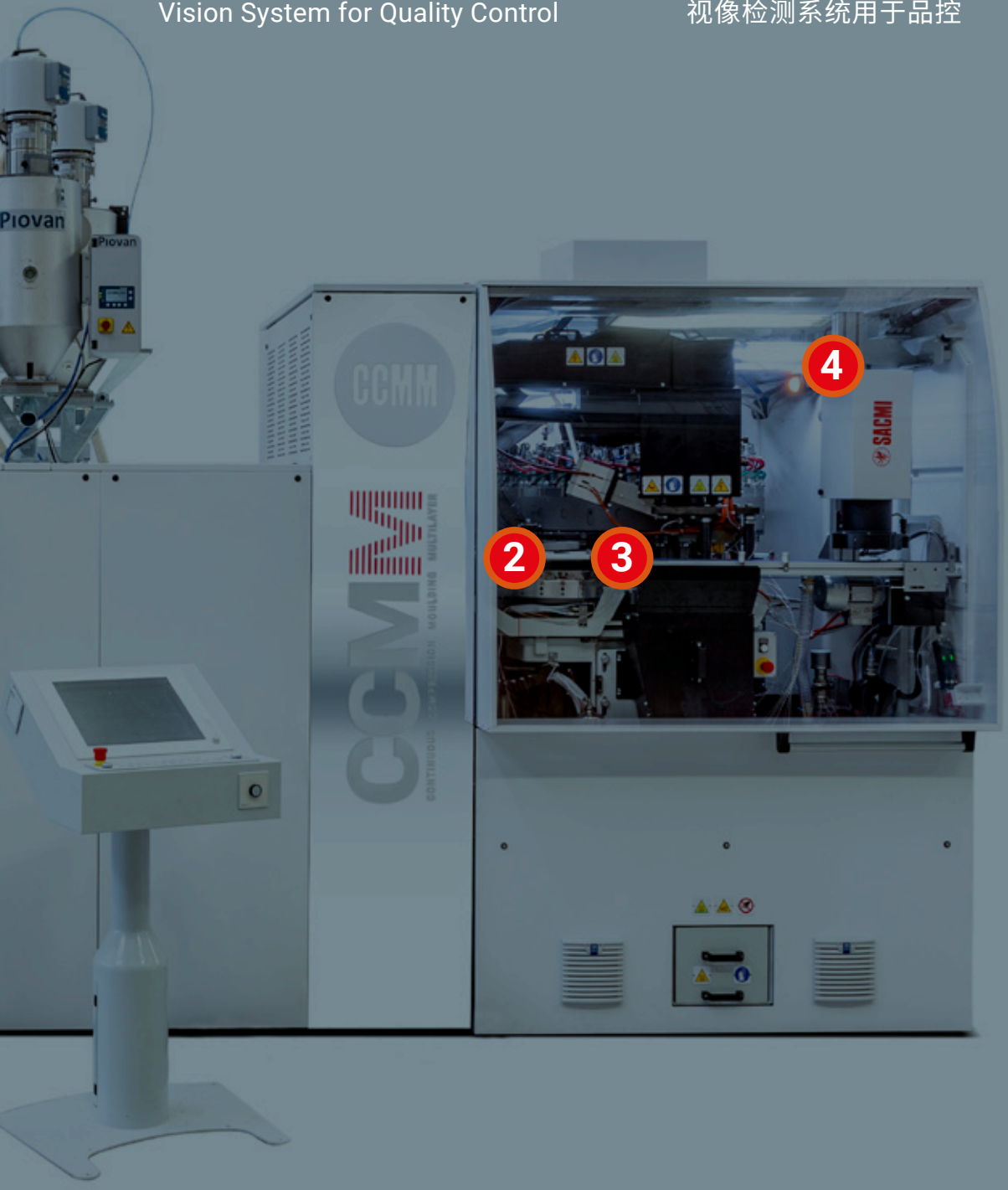
4. CVS 3000:
Vision System for Quality Control

1. 多层共挤设备
配有容量泵，可熔化不同物料

2. 输送系统
切割料粒，输送，并精确投料

3. 多层共挤模块
可控的连续多层流动原料与熔融材料完全对应

4. 视像检测系统CVS 3000
视像检测系统用于品控



CCM™

Key benefits

主要优势

FEATURES THAT MAKE CONTINUOUS COMPRESSION MULTILAYER MOULDING UNIQUE COMPARED TO OTHER TECHNOLOGIES

与其他技术相比，多层连续压塑成型技术更独特出众

FLEXIBILITY

- Possibility of managing a huge variety of materials as plastic materials are processed at lower temperatures compared to other technologies
- Additives and mineral fillers can be used to adjust the mechanical properties of the finished product

灵活性

- 与其他技术相比，由于原料加工温度较低，因此多层连续压塑成型技术适用于不同原料
- 添加剂和矿物质用于调整最终成品的机械性能

CONSISTENCY

- Guaranteed precision thanks to specific techniques, very narrow tolerances

一致性

- 压塑技术的应用确保精度，减小公差

VERSATILITY

- Real-time adjustment of the number of in-capsule layers and their characteristics

多样性

- 咖啡胶囊内部层数和产品特性可实时调整

MULTILAYER CAPSULES AND CONTAINERS. LAYER DISTRIBUTION AND OXYGEN TRANSMISSION RATE

多层胶囊及容器。分层以及透氧率

	THERMOFORMING	CO-INJECTION	COMPRESSION
Barrier layer properties	Barrier resin with lower ethylene content can be used	Only resin with high MFR used (high ethylene content)	Barrier resin with lower ethylene content can be used
Barrier layer thickness	Non-homogeneous: thinner in capsule wall and thicker at the bottom	Hard to achieve a thin EVOH layer	Thin EVOH layer feasible
Barrier layer distribution	Defects might be present	Usually good, but process parameters are not always easy to set up	Complete. EVOH whirl might be present in the capsule flange
Holes	Might be present due to stretching of the material	In flange area, and close to gate, due to co-injection shooting	Improbable but CCMM allows for control of every single capsule and discards those with holes
Adhesive	Separate layers. Usual content: 10 % -15%	Added into the PP. Usual content: 10 % -15%	Separate layers. Usual content: 10 % -15%

	热成型	多层共注	压塑
阻隔层性能	阻隔层采用乙烯含量较低的树脂	只可采用MFR 高的树脂（乙烯含量高）	阻隔层可采用乙烯含量较低的树脂
阻隔层厚度	不均匀： 胶囊壁较薄，底部较厚	EVOH层较厚	EVOH层厚度可调节
阻隔层分布	可能出现缺陷	通常情况下良好，但工艺参数较难设置	完整性强。在胶囊边缘处可能出现EVOH盖翼
孔洞	可能由于材料的拉伸出现孔洞	在边缘处靠近注塑口处会出现孔洞	出现孔洞概率低，压塑技术可剔除带孔洞的产品
粘合剂	每一层粘合剂含量通常为10 % -15%	添加到PP料中，通常粘合剂含量为10 % -15%	每一层粘合剂含量通常为10 % -15%

CCMM™

Sustainable innovation

持续创新

CCMM PRE-EMPTS ANY CHANGES IN STANDARDS GOVERNING THE PROGRESSIVE REDUCTION OF PLASTIC WASTE OR GREATER USE OF RECYCLABLE/REUSABLE MATERIALS

多层连续压塑成型技术在减少废料，采用可回收/可重复使用材料方面优势明显

A BROADER CHOICE OF MATERIALS FOR MORE SUSTAINABLE PRODUCTS

Initially dedicated to the manufacture of 'single serve' capsules (for coffee, tea and other foods and drinks), SACMI's research into multilayer capsules has gone on to yield further outstanding results, such as a capacity to manage a wide variety of materials, minimise rejects through excellent process consistency and adjust the degree of crystallinity of the raw material.

Compression multilayer technology has been successfully tested with polyolefins from different sources (oil based, bio based, PCR process) and with different types of compostable materials (PLA and compostable compounds).

为更多的可持续产品提供更广泛的原料选择

研发初期萨克米致力于单杯胶囊（应用于咖啡，茶以及其它食品饮料）的生产，而多层连续压塑技术取得了突破并进一步优化了产品，例如管理运用更多种材料的能力，通过生产的一致性降低剔除率以及调整原材料的结晶度。

多层连续压塑成型技术成功通过了不同种类聚烯烃原料（油基，生物基，PCR法）以及不同种类可降解原料（PLA以及可降解化合物）的测试。

LESS ENERGY CONSUMPTION, GREATER PROCESS SUSTAINABILITY

Compression works at lower temperatures than alternative technologies, allowing less energy consumption per unit of raw material consumed.

ZERO RAW MATERIAL WASTE

With compression technology the raw material is first optimised, cutting waste to zero to ensure greater process sustainability.

降低能耗，提高工艺可持续性

与其他技术相比，压塑工艺加工温度比较低，每个单位原料消耗量较少。

无废料

采用压塑工艺对原材料优化，将废料降至最低，以提高工艺可持续性。

CCMM™

Versatile solutions

多样化解决方案

THANKS TO SACMI'S EXPERTISE IN COMPRESSION TECHNOLOGY AND MOULD BUILDING, THE CCMM CAN MOULD DIFFERENT PRODUCT TYPES WITH OUTSTANDING DESIGN VERSATILITY

萨克米在压塑工艺和模具制造方面积累的丰富经验使多层连续压塑工艺成为可能，卓越多样的设计灵感使不同种类的产品成为现实

With 30 years of experience and 15,000 stacks a year, SACMI is the world's biggest 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. Applying continuous compression technology to multilayer solutions greatly expands the scope for design, allowing a variety that would be difficult to obtain with rival technologies. With CCMM, in fact, producing characteristic details, pre-defined thin zones and pre-established fracture lines on the capsule is child's play.

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。

不断研发和探索使压塑技术发展成为多层连续压塑成型技术，就其多样化而言，是目前市场上其他技术无法匹敌。

原料拉伸测试中原料细化区和断裂线的准确测量，使多层连续压塑成型技术能应用于多种原料。

Nespresso® compatible
PP-Tie layer-EVOH-Tie layer-PP

与Nespresso® 胶囊兼容
PP-粘接层-EVOH-粘接层-PP

Nespresso® compatibile
PLA-Tie layer-G Polymer -Tie layer-PLA

与Nespresso® 胶囊兼容
PLA-粘接层-G 聚合物-粘接层-PLA

Mod K-CUP® compatibile
PP-Tie layer-EVOH-Tie layer-PP
PLA-Tie layer-G Polymer -Tie layer-PLA

与Mod K-CUP® 胶囊兼容
PP-粘接层-EVOH-粘接层-PP
PLA-粘接层-G 聚合物-粘接层-PLA

Dolce Gusto® compatibile
PP-Tie layer-EVOH-Tie layer-PP

与Dolce Gusto® 胶囊兼容
PP-粘接层-EVOH-粘接层-PP

Lavazza® A MODO MIO® compatibile
PP-Tie layer-EVOH-Tie layer-PP

与Lavazza® A MODO MIO® 胶囊兼容
PP-粘接层-EVOH-粘接层-PP

FOOD CANS for different content
PP-Tie layer-EVOH-tTie layer-PP

FOOD CANS 用于不同产品胶囊
PP-粘接层-EVOH-粘接层-PP

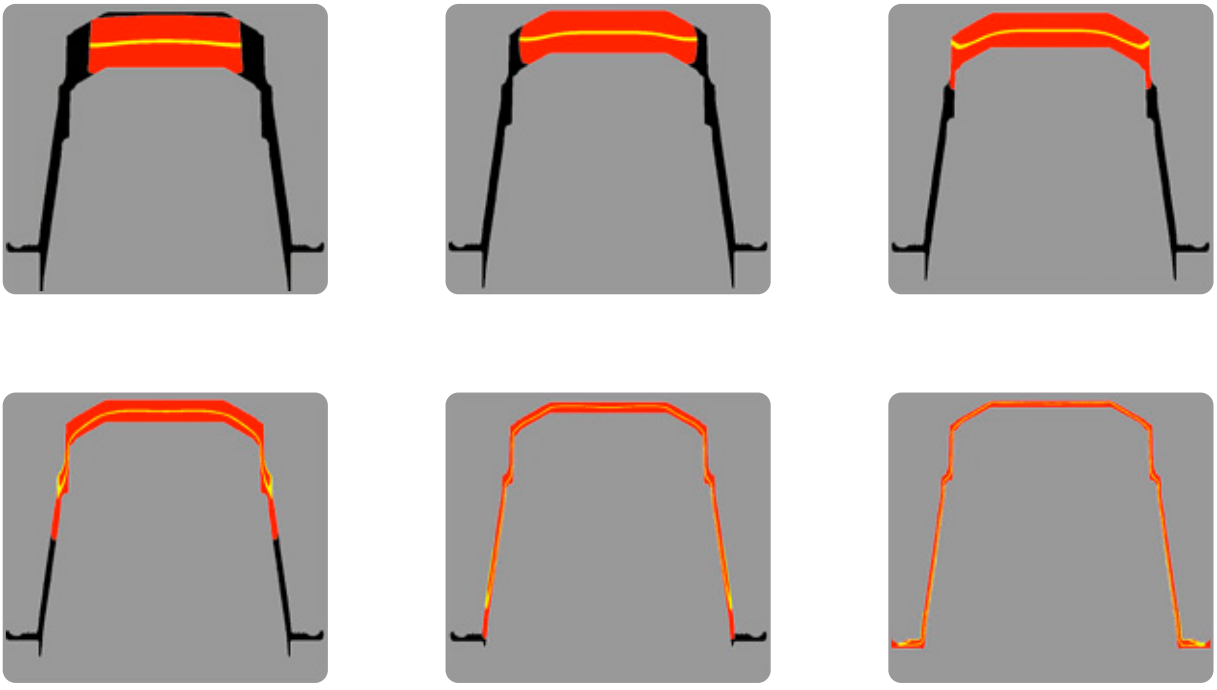
CCM™

Continuous multilayer compression innovation

多层连续压塑成型技术创新

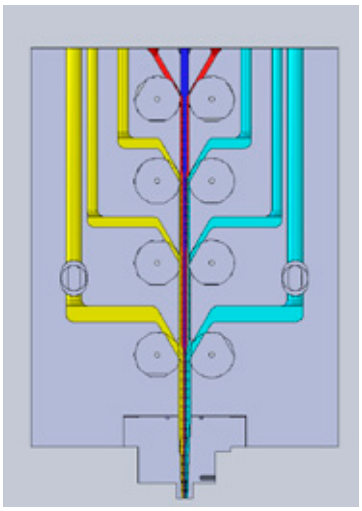
MOULDING PHASE SIMULATION OF LAYER DISTRIBUTION

成型过程 多层模拟分布



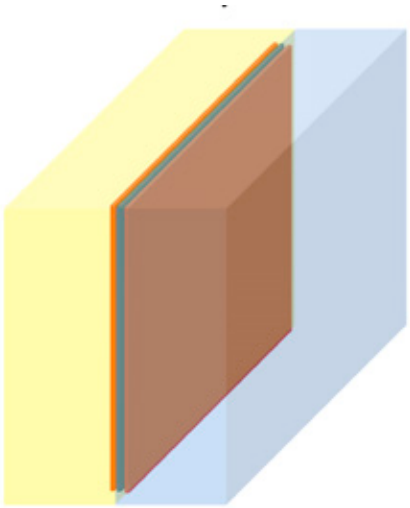
CO-EXTRUSION SYSTEM

CO-EXTRUSION HEAD
MULTILAYER DOSE



多层共挤系统

多层共挤模头
多层挤出量

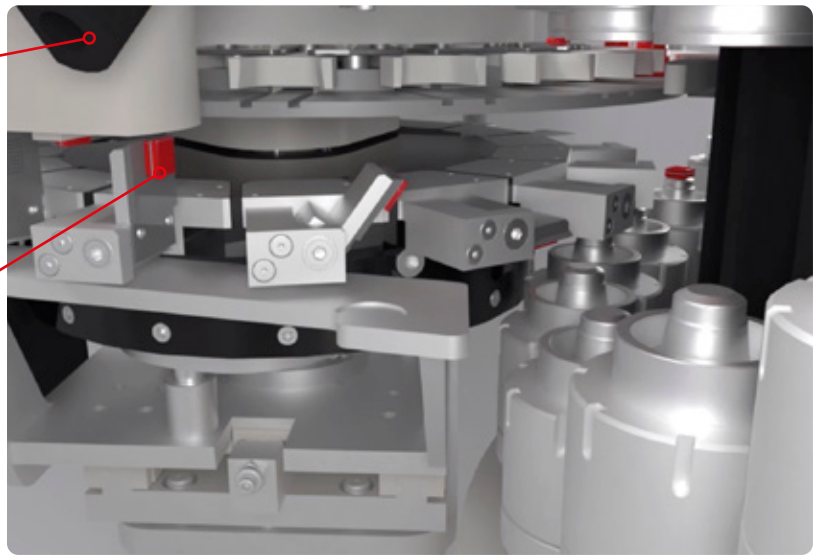


DOSE MANAGEMENT

Main difference compared to standard compression moulding: dose formation and its transfer

挤出管理

与标准压塑成型相比：挤出量与料粒传输



Inspection Systems

Thanks to the experience and skill gained in over 30 years of installing inspection systems, SACMI has established its own Computer Vision department. This department designs and builds specific image capture units for each product type and implements advanced AI algorithms that go beyond routine quality control to extend the control concept to the entire production process.

That's why every single oxygen barrier capsule must be checked meticulously, from the exterior to the core of the multilayer. This is achieved by merging proven surface-type artificial vision technology with new, patented technologies that reach the heart of the product.

- Innovative SACMI CVS360-3D technology for 360° surface inspection
- New, patented image capture unit for automatic barrier layer check
- SACMI CVS3000 64-bit vers.2 software to identify flaws and provide statistical analysis

视像检测设备

超过30年的丰富经验，萨克米视像检测部门为每一种产品设计和创建特定影像捕捉装置，结合先进的人工智能技术，把产品控制和检测概念延伸至整个生产加工过程中。

为确保胶囊质量，每一个产品必须经过仔细筛查，从外部到多层内部，胶囊视像检测设备应运而生。全新萨克米专利胶囊视像检测设备能精确检测产品瑕疵，为产品质量保驾护航。

- 萨克米全新CVS360-3D技术对产品进行360°无死角检测
- 全新萨克米专利影像捕捉装置用于检测胶囊阻隔层
- 萨克米CVS3000视像检测软件用于识别产品缺陷和统计生产参数

1. CAPSULE INSPECTION:

- Contamination on outer walls
- Contamination on inner side walls of capsule
- Bubbles on inner side walls of capsule
- Colour streaks
- Non-conforming capsule heights
- Non-conforming capsule diameters

2. CAPSULE INSPECTION:

- Total or partial absence of barrier layer
- Variations in barrier layer thickness

3. CAPSULE INSPECTION:

- Ovalization
- Missing material
- Colour variations
- Colour streaks
- Non-conforming capsule diameters
- Burr
- Contamination

1. 胶囊检测：

- 外壁污染
- 内壁污染
- 内壁气泡
- 颜色不均
- 胶囊高度
- 胶囊直径

2. 胶囊检测：

- 阻隔层全部或部分缺失
- 阻隔层厚度

3. 胶囊检测：

- 椭圆
- 原料缺失
- 色差
- 颜色不均
- 胶囊直径
- 毛边
- 污染

CVS3000

THE CVS3000 SOFTWARE PLATFORM IS USED BY ALL SACMI VISION SYSTEMS. THIS POWERFUL MACHINE VISION SYSTEM LETS USERS COLLECT AND STORE A COMPLETE SET OF STATISTICS ON THE OVERALL PRODUCTIVITY OF THE MONITORED LINE

视像检测设备软件CVS3000安装于所有萨克米视像检测设备，主要用于收集和存储生产数据，并监督生产线的运行和生产参数

CVS3000 FEATURES

- Fully integrated in SACMI CCMM Compression Moulding Multilayer
- Accurate inspection of product and visible sides
- Inspection rates up to 1000 ppm
- Based on SACMI CVS3000 inspection software
- Self-learning procedure
- Intuitive user interface
- Networking capabilities
- Correlation between defects and tool number

CVS3000的特点

- 与萨克米压塑成型设备完美连线
- 精确检测产品缺陷
- 检测速度高达每分钟1000个咖啡胶囊
- 萨克米CVS3000检测软件
- 简单易操作
- 人机界面
- 联网功能
- 检测产品缺陷与识别模腔功能

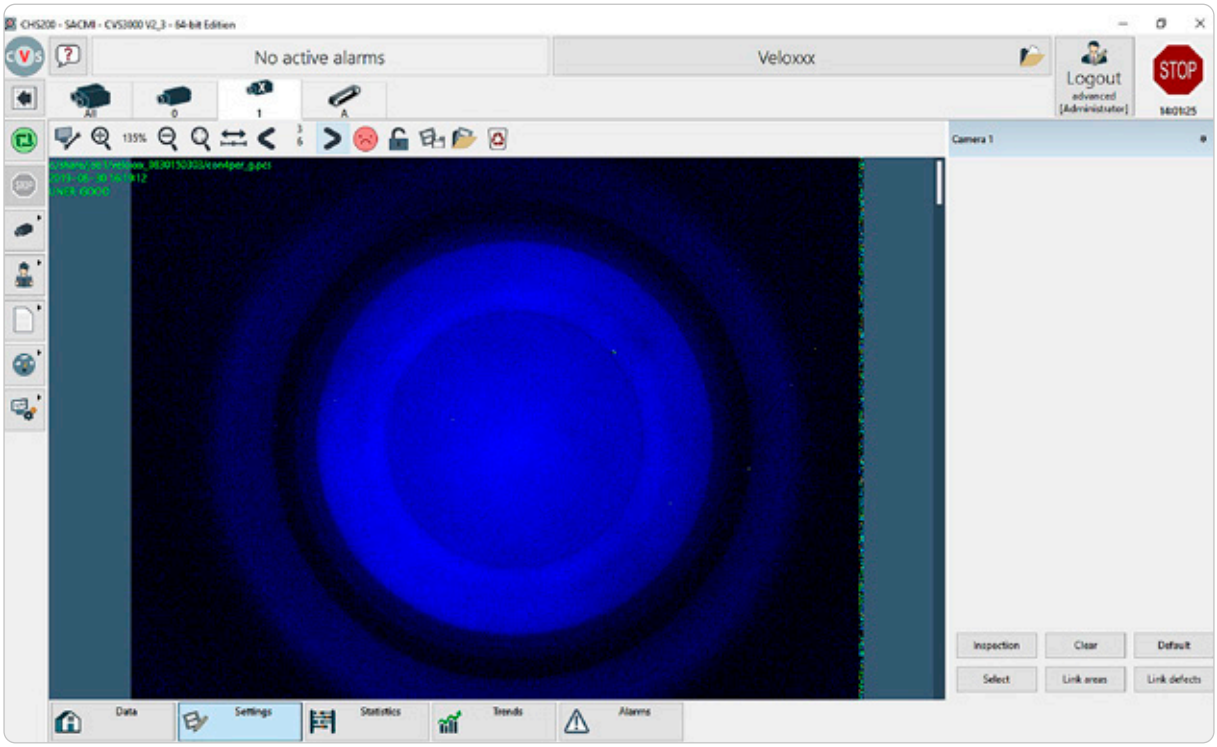
CVS3000 BENEFITS

- Guarantees your quality
- Reduces machine downtime
- Improves efficiency
- Minimises reject flaws
- Streamlines CCMM machine maintenance

CVS3000的优势

- 确保产品质量
- 减少设备停机时间
- 提升效率
- 降低产品剔除率
- 减少设备维护保养时间


SACMI


No active alarms
Veloxxx
Logout
STOP
Camera 1
Inspection
Clear
Default
Select
Link areas
Link defects
Data
Settings
Statistics
Trends
Alarms

EN ZH

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SACMI reserves the right to introduce changes without notice / 28.02.2023

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