Process digitalization and optimization

PVS156: embedded vision inspection system for process and quality control..
SMARTPACK™: digitalizes manufacturing to make it more profitable and sustainable.
SMARTCARE™: maximizes performance through AI-driven pattern recognition.

流程数字化与优化

PVS156: 嵌入式视检系统用于监督加工过程和质量。
SMARTPACK™: 通过数字化转型提高投资回报率
SMARTCARE™: 通过人工智能驱动模式提高性能

PVS 156

SYNERGIC TECHNOLOGY MERGES MACHINE AND INSPECTION SYSTEM

Detect preform and process defects, visible both with the naked eye and under polarized light, and check preform weight, key measurements and temperature: the PVS156 keeps all this under tight control. Fully integrated on SACMI IPS presses, the PVS156 is designed to perform very gentle handling to prevent any stress on the preforms.

The PVS156 performs high-level quality control thanks to the application of five high-resolution

PVS 156

协同技术融合设备和视检系统

检测肉眼和偏振光下可见的瓶坯和工艺缺陷，并测量瓶坯重量、关键尺寸和温度：PVS156可严格监督这些缺陷。PVS156与萨克米瓶坯注塑成型设备IPS完美连线，旨在执行非常温和的操作，以防止瓶坯受到任何应力。

PVS156通过应用五个高清和一个超高清摄像头，实现高质量品控。此外，PVS156检测整个瓶坯温度并测量其重量，生产参数即时反馈，大大缩短开机时间。

cameras and one ultra-high-resolution camera. Additionally, thePVS156 checks the temperature throughout the preform body and checks its weight. All this information provides immediate feedback on production quality, drastically shortening the start-up phase.

Integration also provides statistics on the quality of completed preforms, thus allowing quality to be monitored during production. Any drifts in quality can be intercepted and corrected as they occur, thus preventing the production of non-conforming items.

TECHNICAL SPECIFICATIONS

- Output rate up to 1,200 preforms/hour
- 5 high-resolution video cameras and 1 ultra-high-resolution video camera
- Patented inspection with polarized light and proprietary AI algorithms
- Cavity recognition via proprietary AI algorithms
- Weight control
- Temperature control
- Comprehensive cavity-related statistics, including measurements, temperatures and weights
- Wizard for fast format changeovers
- Remote support via intranet/internet
- Automatic generation of production quality reports.

对瓶坯质量参数值进行统计,从而可以在生产过程中监控质量。任何质量偏差都可以在发生时被拦截和校准,从而防止生产不合格品。

技术参数

- 检测速度高达1200个瓶坯/小时
- 5个高清和一个超高清摄像头
- 偏振光和专有AI算法的专利检测技术
- 通过专有AI算法识别模号
- 重量控制
- 温控
- 模腔统计,包括测量尺寸、温度和重量
- 快速格式转换向导
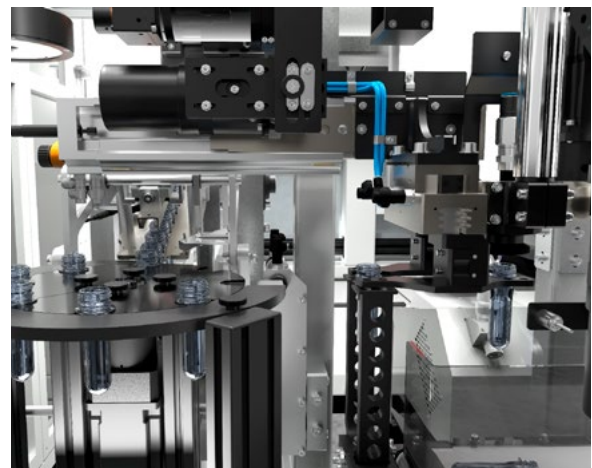- 通过内联网/互联网提供远程支持
- 自动生成生产质量报告。

THE ONBOARD QUALITY CONTROL LAB

Why Choose PVS156?

· Integrated into the IPS injection press, this system operates as an independent control unit without interfering with the machine's cycle time.
· This integration allows for effective quality control without increasing the machine's footprint.
· Sample inspections of preforms occur in-line, enhancing overall efficiency.
· It is particularly suitable for machine start-ups and format changes, enabling quick quality checks.

在线质量控制实验室

为何选择PVS156？

● 该系统集成在IPS注塑机中，作为一个独立的控制单元运行，不会干扰设备的循环时间。
● 这种集成方式允许在不增加设备占地面积的情况下进行有效品控。
● 在线检测瓶坯样品，提高了整体效率。
● 特别适合设备开机，换型简单，可以快速进行质量检测。

OPERATING CYCLE AND ADVANCED FEATURES

Picking

A cartesian robot picks a column of preforms from the gripper plate.

Positioning

The preforms are positioned on the PVS156 roller feeder system.

Inspection

The PVS156 system analyzes the preforms with its sensors and vision tools.

Final selection

After inspection, defective preforms are discarded while compliant ones return to the production stream.

操作周期和高级功能

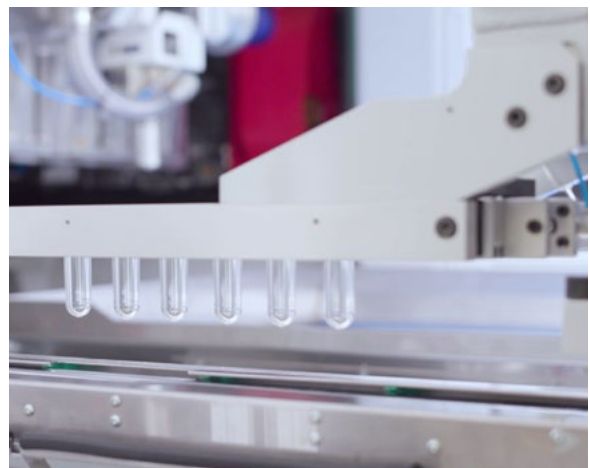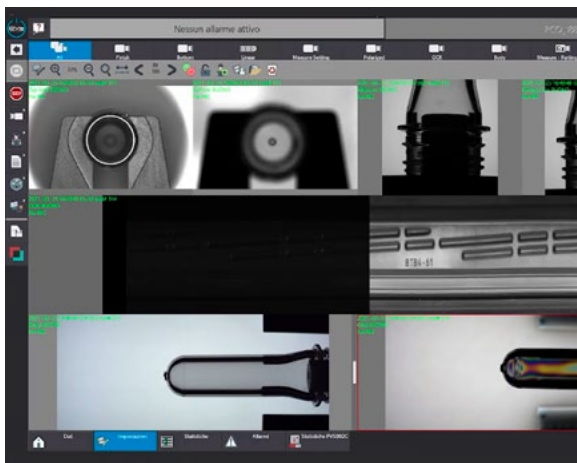### 夹取

机械臂从取坯板上提取一列瓶坯。

定位

瓶坯被放置在PVS156辊式给料机上。

检测

PVS156通过传感器和视觉工具分析瓶坯。

最终选择

完成检测后，剔除有缺陷的瓶坯，合格品将返回生产流程。

INSPECTION CRITERIA
检测标准

Top seal
Short Shots, Ovalizations, Notches, Flashes, Contaminations
顶部密封
缺料、椭圆化、切口、飞边、污染

Thread
Contamination, Flashes, Notches, Black specks
螺纹
污染、飞边、切口、黑斑

Body
Inclusions, Black specks, Opacity, Crystallization, Bubbles, Mould dents, Long gate, Colour deviation and inconsistency, Shape, Scratches
坯身
内容物、黑斑、不透明、结晶、气泡、凹痕、长尾、偏色、色彩不均匀、外观、刮擦

Body using polarized light
Orange peel, Pinches, Watermarks, Surface deformation, Shrinkages, Semi-transparent crystallization, Mould marks, Thermal degradation
偏振光检测坯身
橘皮、收缩、水痕、表面变形、半透明结晶、模痕、热降解

Bottom
Crystallization, Pinhole, Inclusions, Off-centre gates, Bubbles, Unmelt resin, Black specks, reduced thickness
坯底
结晶、孔洞、内容物、注塑口未对中、气泡、未融化树脂、黑斑、壁厚

Dimensional controls
Perpendicularity, Wall thickness, Thread segments height, Finish height, Inner and outer diameter of the topseal, Support ring diameter, Base diameter, Precision (referred to a Ø28 finish): 0.03m
检测尺寸
垂直度、壁厚、螺纹高度、瓶口高度、顶部密封的内外径、支撑环直径、坯底直径、精度（以28mm瓶口的瓶坯为例）：0.03m

Weight
Precise to 0.05 g
重量
精确到0.05g

Parting line inspection
Minimum thickness: 0.2 mm
检测合模线
最小厚度：0.2 mm

SMARTPACK™

DIGITALIZING PRODUCTION TO MAKE IT MORE PROFITABLE AND SUSTAINABLE

SMARTPACK™

通过数字化转型提高投资回报率

WHY SMARTPACK™?

- to maximize OEE
- to increase line availability
- to minimize and simplify process and machine tasks

WHAT ARE THE CHARACTERISTICS OF SMARTPACK™?

SMARTPACK™ is a premium on-board hardware and software package designed to act quickly and precisely on your production process.

HOW DOES SMARTPACK™ WORK?

SMARTPACK™ digitalizes the process

Hardware: best-in-class with built-in sensors, transducers, and visual inspection systems.

Software: proprietary AI algorithms (developed in-house), user-centric HMI and data-driven auto-tuning.

为何选择SMARTPACK™？

- 设备综合效率(OEE)最大化
- 提高生产线利用率
- 尽量减少和简化对工艺和设备的干预

SMARTPACK™有哪些主要特点？

SMARTPACK™是一个高级软硬组件，旨在针对生产过程及时反馈信息采取快速和恰当的行动。

SMARTPACK™如何运行？

SMARTPACK™ 数字化流程

硬件：内置传感器、换能器和视检系统

软件：萨克米自研专有AI算法、以用户为中心的操作界面(HMI)和数据驱动的自动调整系统

SMARTPACK™ speaks the operator's language

A simple, user-friendly environment for controlling the process that makes excellent use of proprietary AI algorithms to provide:

- Easy start-up: do you want the operator to be guided through every stage of the production start-up?
- Simple monitoring: would you like to keep a constant eye on the process, even when you're away?
- Chatbots: would you like to have all the know-how at your fingertips when you need it most?

SMARTPACK™ shifts the burden of skills, costs, and variability from the operator to the machine with the following:

- Auto-tuning functions
- Detection of drifts before they turn into defects thanks to the PVS, the embedded visual preform inspection system.
- Data-driven feedback guides effective, fast, accurate actions in the process.

SMARTPACK™采用操作员的语言

一个简单易用的过程控制环境，充分利用专有的人工智能算法提供：

- 轻松启动：您是否希望操作员在生产启动的每个阶段都能得到指引？
- 简单的监控：即使您不在，您也可以时刻关注加工过程吗？
- 聊天机器人：您想即刻掌握所有专有知识和技术吗？

SMARTPACK™通过以下方式将功能、成本和可变性的负担从操作员转移到设备上：

- 自动调优功能
- 得益于嵌入式视检系统PVS，在偏移转变成缺陷之前对其进行检测。
- 由数据驱动的即时反馈在生产过程中发挥作用，并采取有效、快速、准确的行动。

SMARTCARE™

MAXIMIZE PERFORMANCE THROUGH AI-DRIVEN PATTERN RECOGNITION

SMARTCARE™

通过人工智能驱动模式提高性能

WHY

To optimize your decisions on the basis of objective data, thus predicting the behavior of your machines.

HOW

- By monitoring the 'health' status of your machines in the mid-long term by collecting data from connected machines.
- By analyzing data with cloud computing resources and proprietary AI algorithms.
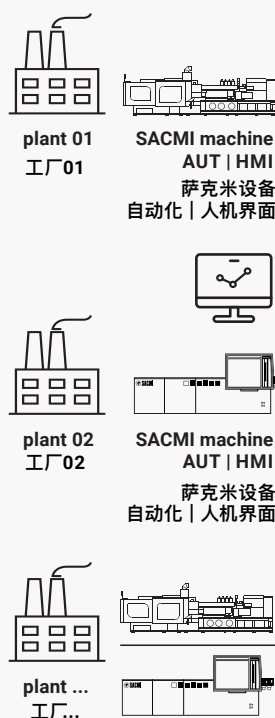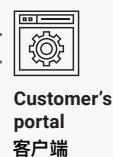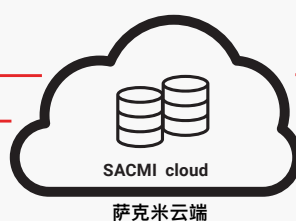
理由

根据客观数据，预测设备的行为，做出适当和合理的决策。

如何

- 通过与设备连线收集数据，监测设备中长期"健康"状态
- 使用云端资源和AI算法分析数据

CUSTOMER MANUFACTURING PLANTS
客户工厂

SACMI MONITORING ROOM
萨克米远程管理中心

plant 01
工厂01

SACMI machine
AUT | HMI
萨克米设备
自动化｜人机界面

SACMI cloud
萨克米云端

plant 02
工厂02

SACMI machine
AUT | HMI
萨克米设备
自动化｜人机界面

Customer's portal
客户端

plant ...
工厂...

Adding proactive services:

- Maintenance engineering
- Customer service
- Mechanical engineering R&D
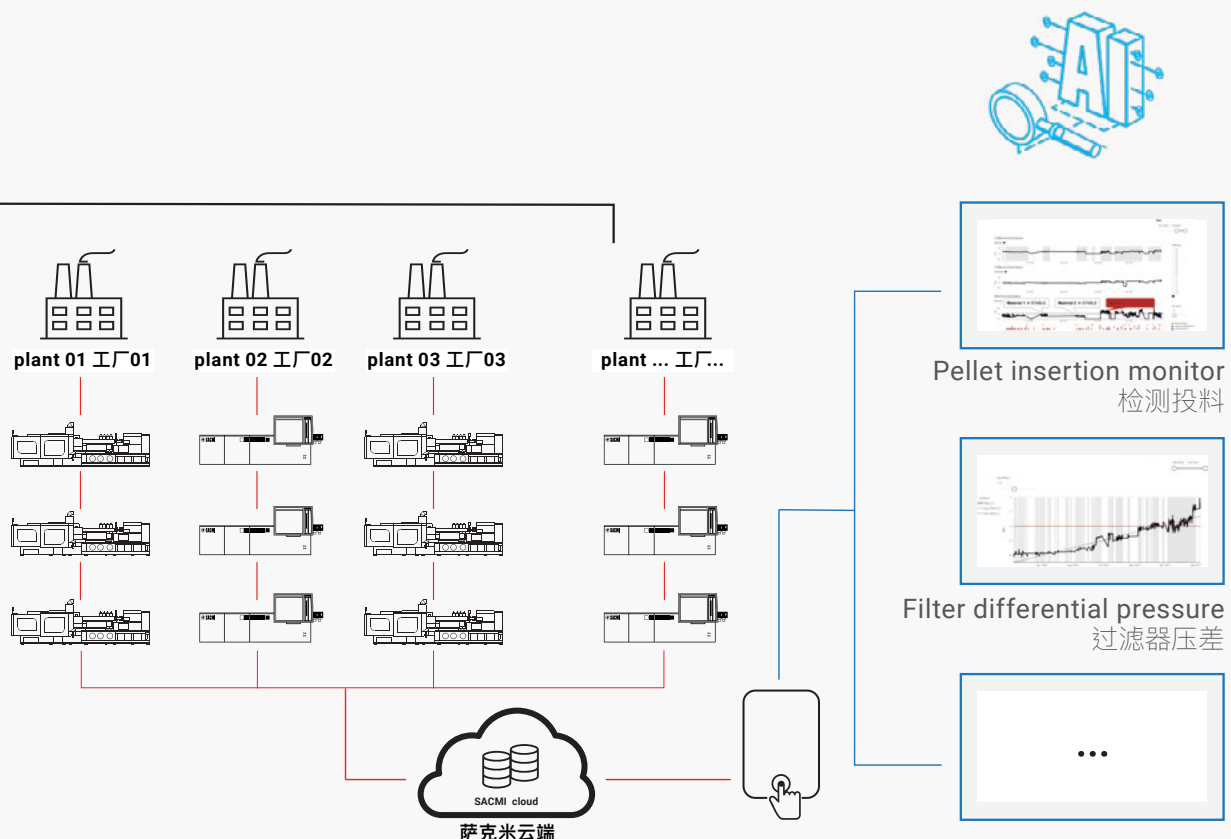
远程服务：

- 维护工程
- 客户服务
- 机械工程研发

WHAT

SMARTCARE™ is an advanced digital service based on cloud technology. It is available for machines connected to the IoT platform and provides KPIs and information that managers can convert into economic value.

概述

SMARTCARE™是一种基于云端技术的先进数字服务，可用于连接到物联网平台的设备，从而提供关键绩效指标和信息，帮助管理者将其转化为经济价值。

plant 01 工厂 01   plant 02 工厂 02   plant 03 工厂 03   plant ... 工厂...

SACMI cloud
萨克米云端

Pellet insertion monitor
检测投料

Filter differential pressure
过滤器压差

...

...

Customer service

客户服务

The SACMI network provides after-sales service via its headquarters in Imola and its worldwide service centers. These services have three main areas:

SACMI ACADEMY

- Technical/technological training services tailored to a wide range of needs and professional profiles.
- The certainty of having immediate access to SACMI know-how throughout the entire lifespan of your equipment.

通过位于伊莫拉的萨克米总部及其全球服务中心提供售后服务，涉及三个主要领域：

萨克米学院

- 根据广泛需求和专业背景量身定制的技术/技术培训服务。
- 在设备的整个生命周期内，都可以了解更多萨克米的专业知识。

DAILY SUPPORT

The right information/part/service
- where you need it
- when you need it

ADVANCED SERVICES

- Process digitalization, behavior prediction powered by AI and the IoT platform
- Smart services, preventive maintenance contracts
- Life extension and retrofitting

日常支持

正确的信息/零件/服务
- 在您需要它的地方
- 当您需要它的时候

高级服务

- 由人工智能和物联网平台驱动的流程数字化和行为预测
- 智能服务、预防性维保协议
- 延长使用寿命和改装设备