Computer Vision Systems

for plastic caps, preforms and bottles

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视像检测设备

适用于检测塑料瓶盖，瓶坯和塑料瓶

SACMI

SACMI Computer Vision technology

萨克米视像检测技术

THE EYES OF INDUSTRY 4.0

The most advanced Artificial Vision technology for the PET Preform Industry.
CVS3000, Cavity Recognition and Grid Inspection are just some of the technologies developed by SACMI and placed at your disposal to ensure Total Quality Control of your products.

工业4.0之品控系列产品

尖端人工智能与视像检测技术充分结合，实现PET瓶坯领域精确品控。
萨克米研发CVS3000视像检测软件，不仅适用于检测产品缺陷，还适用于识别模腔，以及栅格检测技术等为产品质量保驾护航。

GOOD
优质品

GOOD
优质品

BAD
不良品

GOOD
优质品

GOOD
优质品

GOOD
优质品

CVS web

远程技术

Panorama
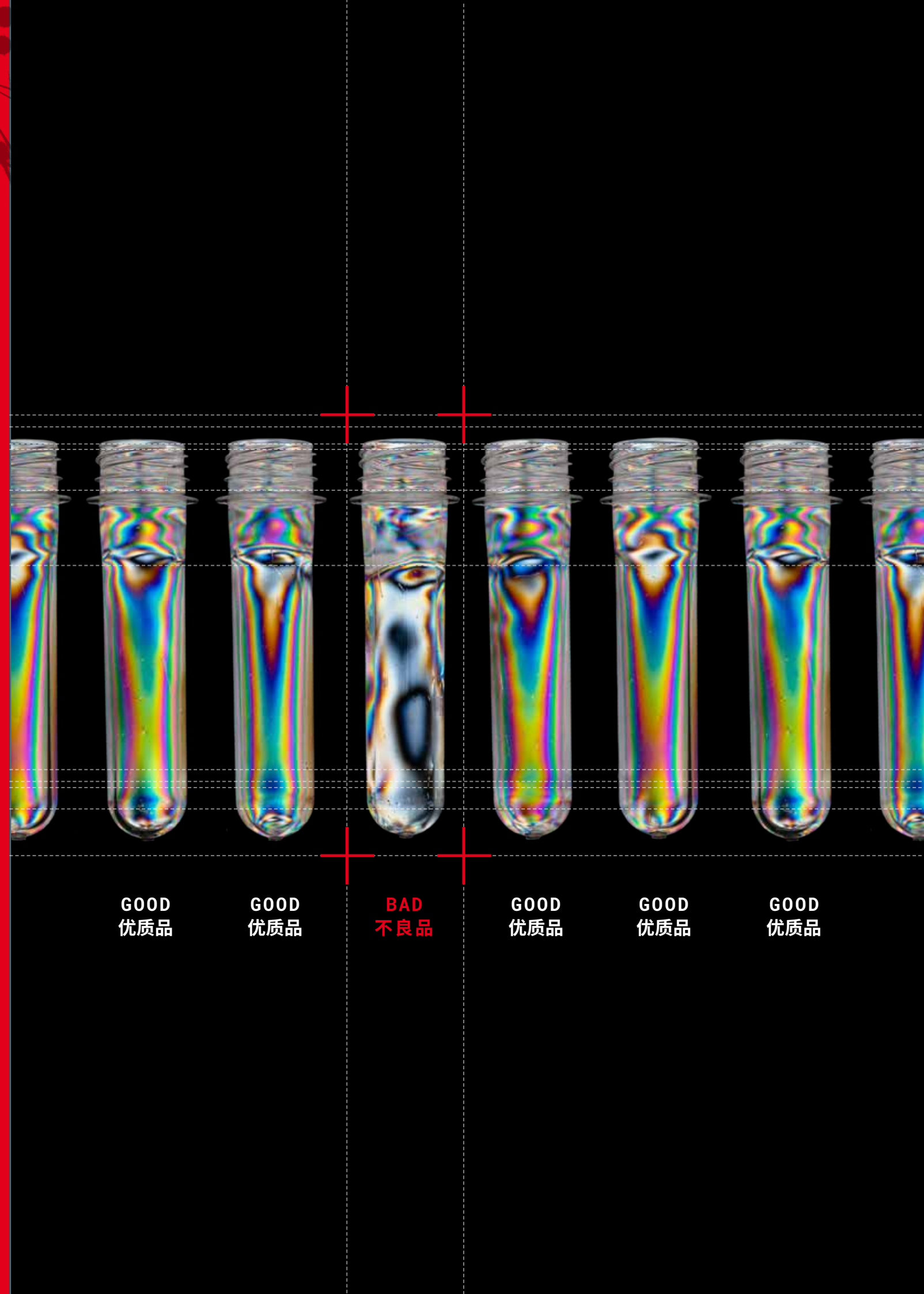
THE VISION SYSTEM THAT'S ALWAYS WITH YOU

视像检测设备 – 随时捕捉并追踪产品质量

REMOTE VISION SYSTEM MONITORING. ALL YOUR VISION SYSTEMS AT A GLANCE

视像检测设备远程监控，为产品提供全方位的质量保证。

SACMI vision systems feature the CVSWEB module, which allows Vision System data to be displayed on the WEB.

A wealth of information - counters, alarms, machine status and much more - can be displayed remotely, without having to be in front of the equipment. Pages can be displayed on any computer or mobile device authorised to connect to your company network.

萨克米视像检测设备远程模块使生产数据和设备参数在网络上实时呈现。

生产数据和设备参数将不再局限于单个工厂。经过厂内连接和授权，与设备相关的大量生产信息，如产量、运行状态、设备报警等生产信息均可以通过远程方式在电脑或是智能手机上显现。

When multiple Sacmi Vision Systems are installed in a plant, PANORAMA can be used to provide real-time information on all the systems in that plant: active alarms, key statistical data, current inspection recipe.

PANORAMA can be viewed on the server screen or any network computer using your favourite browser.

萨克米视像检测设备Panorama系列全面监督产品质量，包括实时监督生产数据，当前检测数据，以及设备预警等设备状态。

Panorama远程监控系统可以通过浏览器在电脑上或服务器上查询所需数据和实时监控生产参数。

Computer Vision Systems for **Plastic Caps**

视像检测设备
适用于塑料瓶盖

Through its extensive experience as the leading producer of plastic capsule compression moulding machines, SACMI has developed a complete line of inspection machines and systems.
Vision systems and spark testers provide daily help that is essential to all cap makers.

萨克米塑料瓶盖压塑成型设备在全球饮料包装领域赢得广泛好评，萨克米也因此研发相应的视像检测设备适用于检测塑料瓶盖。

视像检测设备和火花测试仪对每一位瓶盖生产商而言至关重要。

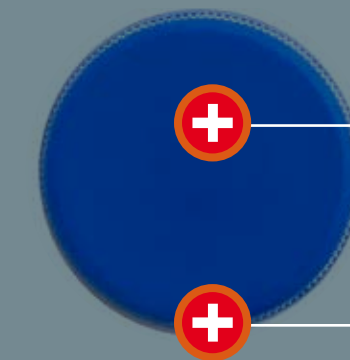**INSPECTION OF THE SIDEWALL**
- TEB and bridges
- Contamination

侧壁检测
- 防盗环
- 污染

INSPECTION OF THE ARTWORK:
- External side wall inspection
- Contamination/stains
- Black specks
- Wrong colour/colour variations
- Mixed caps
- Printing off-centre
- Colour misalignment
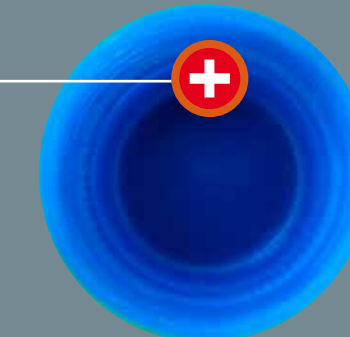
印刷面检测:
- 外壁检测
- 污染/污渍
- 黑斑
- 错印/色差
- 混色
- 不对中
- 色差

INSPECTION OF THE INSIDE
(1-piece caps)
- Deformation in plug seal
- Flashes in plug seal
- Flaws in plug seal
- Thread
- Black specks
- Contamination

内部检测:
(单片盖)
- 内塞变形
- 内塞飞边
- 内塞缺陷
- 检测螺纹
- 黑斑
- 污染

INSPECTION OF THE SHELL:
- Short shots
- Colour
- Contamination
- Ovalization/Diameter
- Deformation
- Flashes on top ring
- Broken TEB
- Cavity number reading
- Cavity-related statistics
- Alarm by cavity number
- Sort by cavity number

盖壳检测:
- 缺料
- 颜色检测
- 污染
- 椭圆/直径
- 变形
- 顶部飞边
- 防盗环破损
- 模腔判读
- 各模腔生产数据
- 模腔号预警
- 按模腔号排序

INSPECTION OF THE LINER:
(2-piece caps)
- Presence/Absence
- Bubbles
- Voids
- Flashes
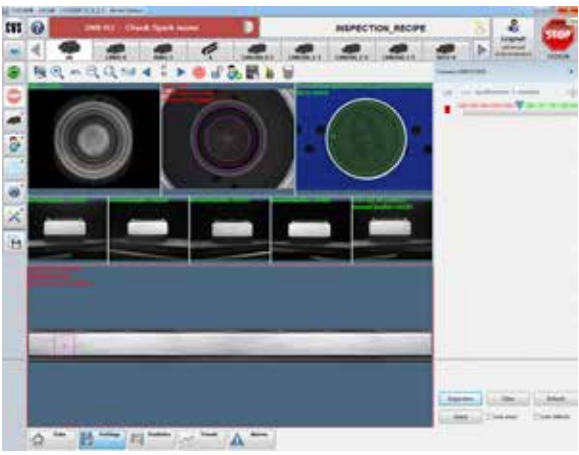- Black specks
- Contamination
- Gasket flaws
- Thread

内垫检测:
(双片盖)
- 瓶盖缺失
- 气泡
- 空隙
- 飞边
- 黑斑
- 污染
- 内垫缺陷
- 螺纹

CHS

PLASTIC CAP INSPECTION AND
SORTING MACHINE

塑料瓶盖视橡检测设备和理盖机

The CHS can easily be integrated downstream from any manufacturer's production machine and can be used off-line to reprocess HFI batches.

The CHS features up to 7 cameras to check both functional sides and decorated sides (bottom and side wall) at rates of up to 4,000 caps/min.

Thanks to the innovative CVS360-3D module, the CHS can reconstruct 3D objects as 2D images precisely, eliminating any distortion that might stem from perspective, lens, cap shape or surface reflection.

视像检测设备CHS能与下游设备连线生产，并可离线进行HFI批次处理。

视像检测设备CHS配有7个摄像头，分别对瓶盖侧壁和印刷面（包括瓶盖底部）进行检测，检测速度高达每分钟4,000个瓶盖。

CVS360三维创新模块的应用，使视像检测设备CHS在运行时对捕捉到的3D图像进行2D重塑，对各角度，镜头，瓶盖外形或顶部影像进行精确重构，避免产生影像失真的现象。

Computer Vision Systems for **Preforms**

视像检测设备适用于瓶坯

With over 50 years of experience in designing machines and systems for the packaging industry, SACMI has developed proprietary technology for each stage of production, from moulding to quality/process control systems that ensure 100% inspection of every single product.

The Computer Vision department has developed preform inspection machines that meet each individual customer's specific needs. Continuous research into new technology and heavy investment make SACMI Computer Vision the leading provider of high-end solutions that combine external preform inspection with internal PET quality control systems that use polarized light and advanced AI algorithms.

在包装领域,超过50年设备生产经验,萨克米专有技术涵盖饮料包装设备的方方面面,从成型到品控,确保每一个产品质量。

萨克米视像检测部持续不断的研发以满足市场与客户的各类品控要求。在新技术持续创新和研发方面的大量投资旨在为饮料包装行业提供先进的视像检测设备解决方案,结合瓶坯检测技术、PET瓶坯品控软件、偏振光检测和人工智能等技术应用为产品质量保驾护航。

INSPECTION OF THE TOP SEAL: 顶部密封检测:

- Short Shots · 缺料
- Ovalizations · 椭圆
- Diameters · 直径
- Flashes · 飞边
- Contamination · 污染

INSPECTION OF THE FINISH: 瓶口检测:

- Contamination · 污染
- Flashes · 飞边
- Insufficient material · 缺料
- Black specks · 黑斑

DIMENSIONAL CONTROLS (PVS-2 only):

- Perpendicularity
- Wall thickness
- Thread segments height
- Finish height
- Support ring diameter
- Base diameter
- Precision (for a Ø28 mm neck finish): 0.03 mm

尺寸检测:
(仅适用于PVS-2机型):

- 垂直检测
- 坯壁厚度
- 螺纹高度
- 瓶口高度
- 支撑环直径
- 坯底直径
- 精度 (适用于Ø28mm瓶口): 0.03mm

INSPECTION OF THE BODY:

- Inclusions
- Black specks
- Opacity
- Crystallization
- Bubbles
- Thermal degradation
- Mould dents
- Water marks
- Long gate
- Side wall deformations
- Colour deviation and inconsistency
- Shape

坯身检测:

- 杂质
- 黑斑
- 不透明
- 结晶
- 气泡
- 热降解
- 凹陷
- 水痕
- 浇口过长
- 侧壁变形
- 偏色和不均匀
- 瓶坯外形

POLARIZ. LIGHT BODY INSPECTION:

- Orange peel
- Scratches
- Pinches
- Deep water marks
- Surface deformation
- Shrinkages
- Semi-transparent crystallization
- Mould marks

偏振光坯身检测:

- 橘皮
- 刮擦
- 挤压
- 深度水痕
- 表面变形
- 皱缩现象
- 半透明结晶
- 成型痕迹

INSPECTION OF THE BOTTOM: 底部检测:

- Crystallization · 结晶
- Pinhole · 注塑点
- Inclusions · 杂质
- Off-centre gates · 注塑点不对中
- Bubbles · 气泡
- Unmelted resin · 未完全融化的树脂原料
- Black specks · 黑斑

PVS

PET PREFORM INSPECTION AND SORTING MACHINE

PET瓶坯视像检测设备以及理坯机

A wide range of quality control machines to meet all the needs of PET preform manufacturers.

In order to meet individual inspection requirements, the range offers several models. The PVS-2 is a sampling machine designed to assist quality control workers, while the compact PVS-5 has been designed for easy on-line installation with a new or existing injection press (made by any manufacturer). At the top of the range is the innovative PVS10 with fully automated size changeover, designed for off-line installation with frequent size changeovers.

PET瓶坯视像检测设备可满足瓶坯生产所有需求。

多种视像检测设备满足各类瓶坯检测需求。PVS-2是协助工人进行质量控制的抽样设备，而PVS-5则更为兼容，可与全新的或者现有任一厂商的注塑机在线安装连接。创新型的PVS10可实现全自动化尺寸更换，可离线安装，更换更为快捷。
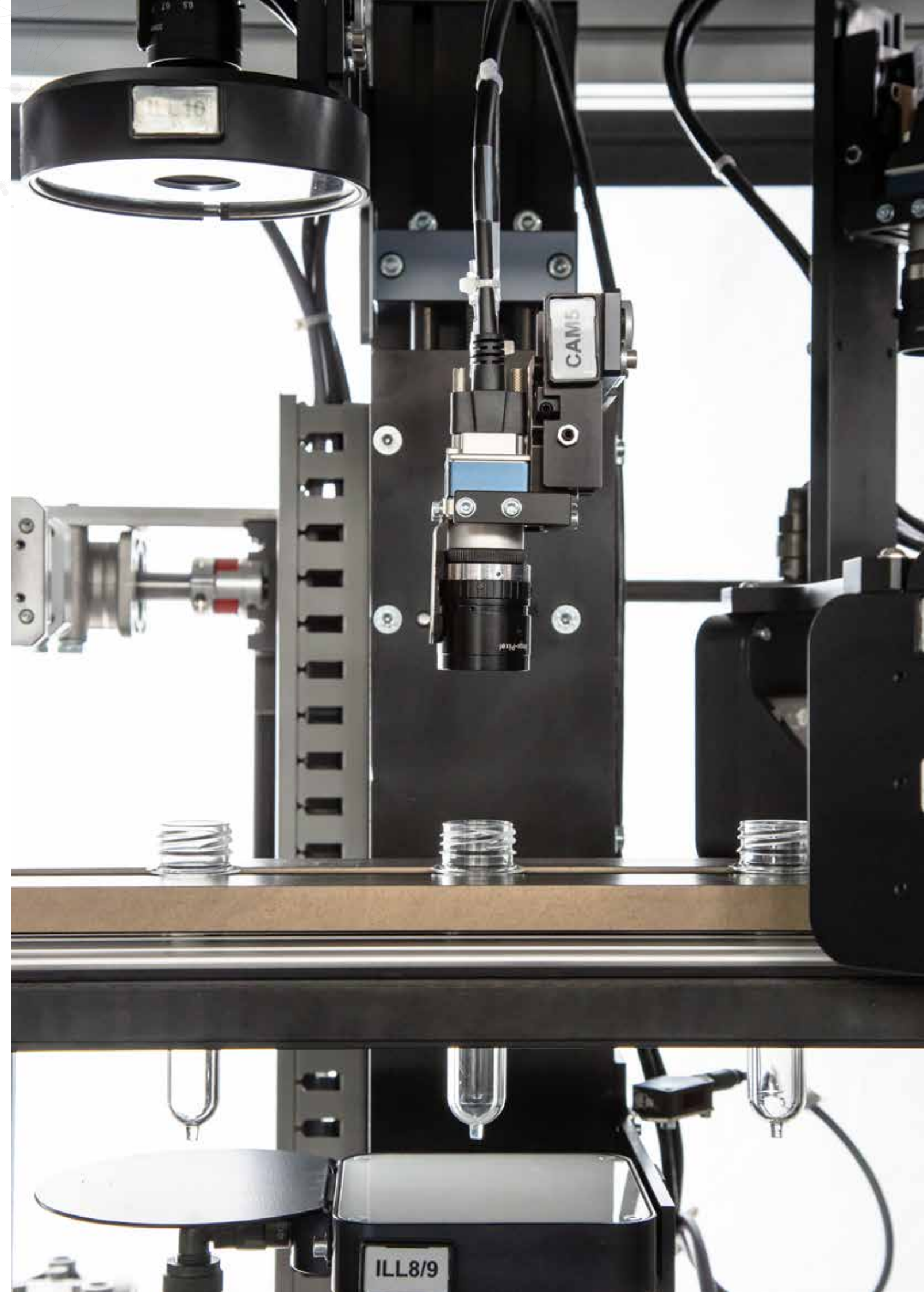
Computer Vision Systems for **Bottles and Container**

视像检测设备适用于检测各类容器

Our BVS is specifically engineered for **complete inspection** of containers made from all the most commonly used plastic types, with particular attention to the needs of the **pharmaceutical sector**.

The **BVS checks** the whole container: top seal, finish, side wall and bottom.

The BVS provides flaw statistics by cavity number, thus providing fast and simple feedback for maintenance, quality control and production. It can, moreover, be installed after any new or existing IBM or EBM production line.

视像检测设备BVS为各类塑料容器进行全方位检测，除饮料包装行业以外，也可满足医药行业的检测需求。

视像检测设备BVS可对容器的顶部密封、瓶口、侧壁以及底部进行检测。

视像检测设备BVS可通过单个模腔进行缺陷分析统计，为维护、质量控制以及生产提供更为方便快速的信息反馈。不仅如此，BVS可安装于任何全新或者现有的IBM以及EBM生产线。

INSPECTION OF THE TOP SEAL: | 顶部密封检测:
- Inner diameter · 内部直径
- Outer diameter · 外部直径
- Ovalization · 椭圆
  Incomplete seals · 密封不完整
  Contamination · 污染
- Flashes · 飞边
- Scratches · 划痕
- Black specks · 黑孔

INSPECTION OF THE THREAD:
- Measurements

螺纹检测:
· 尺寸测量

INSPECTION OF THE INTERNAL NECK: | 瓶颈内部检测:
- Contamination · 污染
- Flashes · 飞边
- Excess material · 原料过多
- Black specks · 黑斑

INSPECTION OF THE 360 SIDE WALL: | 瓶壁360度检测:
- Contamination · 污染
  Reduced thickness · 厚度不够
  Deformation · 变形
- Colour smears · 色斑
- Black specks · 黑点
- Bubbles · 气泡
- Unmelts · 未融化杂质

INSPECTION OF THE INTERNAL BOTTOM: | 瓶底内部检测:
- Contamination · 污染
- Reduced thickness · 厚度不够
- Black specks · 黑斑

INSPECTION OF THE EXTERNAL BOTTOM: | 瓶底外部检测:
- Contamination · 污染
- Reduced thickness · 厚度不够
- Black specks · 黑斑

CAVITY RECOGNITION | 模腔识别:
- Cavity number reading · 模腔判读功能

BVS Cont-Check 360

CONTAINER INSPECTION

容器视像检测设备

The Cont-Check 360 system can be installed either on the exit conveyor of the CBF machine (SACMI Compression machine for containers) or in-line with any new or existing IBM or EBM machine.

Mainly used in the pharmaceutical field, the Cont-Check 360 can inspect a wide range of sizes and materials: PET, LDPE, HDPE, PE, PP. Machine modularity lets manufacturers inspect 100% of the container.

Thanks to the height adjustment system (manual or automatic) the same machine can inspect a wide range of sizes from ophthalmic to large tablet containers.

容器视像检测设备Cont-check 360系列可安装在萨克米吹瓶压塑成型设备CBF出口处也可安装在任何新生产线或现有IBM或EBM设备上。

容器视像检测设备Cont-check 360主要运用在制药领域，可用于检测多种不同尺寸和材料：PET、LDPE、HDPE、PE、PP。设备模块化使制造商能百分百的检测和监督容器质量。因其高度可调节系统（手工或自动），同样的设备可检测不同尺寸的容器，从眼药水瓶到药剂类容器均可适用。

Cont-Check 360 can be equipped with:

· up to 8 cameras to inspect the entire container, top seal, finish, body and bottom included

· 4 lateral colour cameras and the CVS-360-3D module perfectly reconstruct the side wall as a 2D image

· 1 top camera for top seal inspection

· bottom inspection camera

· 1 top camera for finish inspection

· 1 top camera for inner side wall and bottom inspection

· cavity number can be read and correlated with the inspected container; containers can be sorted by cavity number.
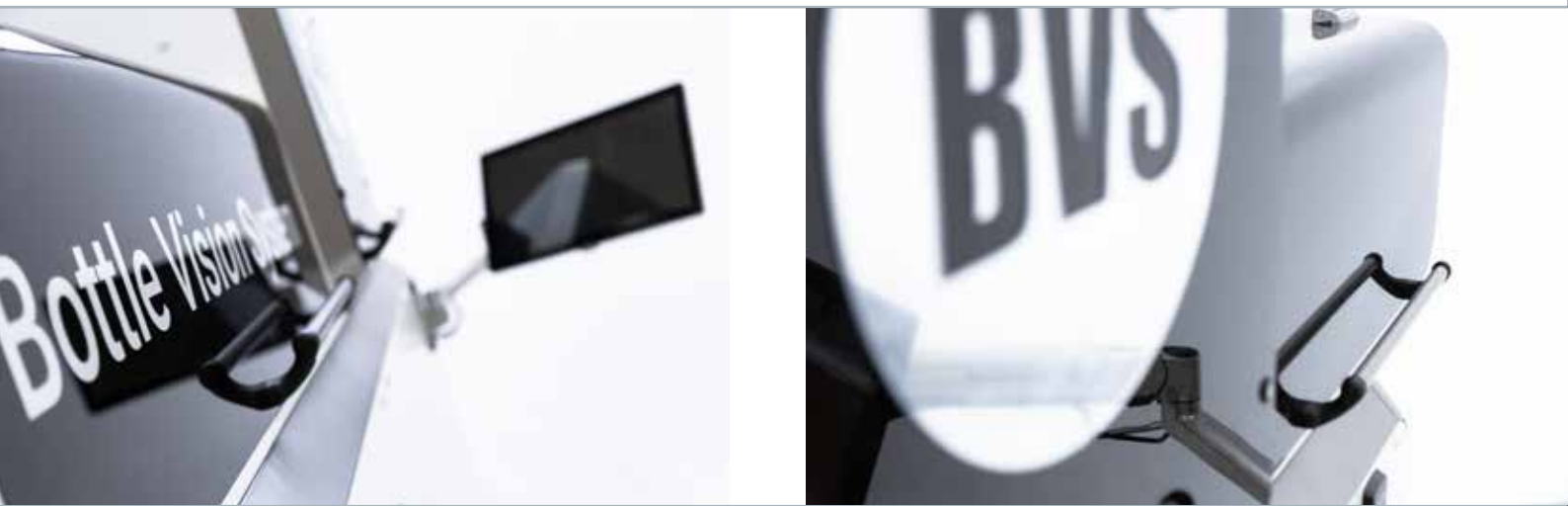
容器视像检测设备Cont-check 360配有：

· 多达8个摄像头用于检测整个容器，包括顶部密封，瓶口，瓶身和瓶底

· 侧边安装4个彩色摄像头和CVS-360-3D模块完整重现2D图像

· 1个顶部摄像头用于检测顶部密封

· 瓶底检测摄像头

· 1个顶部摄像头用于检测瓶口

· 1个顶部摄像头用于内部侧壁和瓶底检测

· 模腔识别作用于不同模腔号，并与所检测的容器产生关联，通过模腔号可对容器进行分类。

BVS Bottle-Check-360

BOTTLE INSPECTION   容器视像检测设备

BVS Bottle Check-360 is a modular system that can be configured with up to 8 cameras to inspect the entire bottle.

BVS Bottle Check-360 can inspect labelled, non-labelled or decorated bottles and containers with a maximum height of 390 mm. Thanks to user-friendliness and self-learning procedures, BVS Bottle Check-360 can be put into service very quickly. Where applied on bottling lines, the BVS Bottle Check-360 is available in stainless steel and with an IP65 protection rating.

容器视像检测设备Bottle-check　360是一个模块化系统，可配置多达8个摄像头用于检测整个瓶身。

容器视像检测设备Bottle-check　360可以检测已贴标、未贴标或印刷后的瓶身和容器，这些瓶身和容器的最大高度为390毫米。

容器视像检测设备Bottle-check　360操作简单，易学易用。容器视像检测设备Bottle-check 360机架采用不锈钢，IP65保护涂层。

BVS Bottle-Check-360 can be equipped with:
· 4 lateral colour cameras and the CVS-360-3D module to perfectly reconstruct the side wall as a 2D image
· 1 top camera for top seal inspection
· bottom inspection camera
· 1 top camera for finish inspection
· 1 top camera for inner side wall and bottom inspection

容器视像检测设备Bottle-check 360配有：
· 侧边安装4个彩色摄像头和CVS-360-3D模块完整重现2D图像

· 1个顶部摄像头检测顶部密封
· 瓶底检测摄像头
· 1个顶部摄像头用于检测瓶口
· 1个顶部摄像头用于检测内部侧壁和瓶底

Dynamic compensation of container dimension variations with respect to 3D model to ensure more reliable reconstruction

使用3D模型根据容器的尺寸变化进行动态捕捉，确保图像重现的可靠性。

SACMI