



Post
processing lines
for plastic closures



后道加工生产线
适用于塑料瓶盖



SACMI

ENDLESS INNOVATION SINCE 1919



Post processing solutions

后道加工解决方案

MANUFACTURING LINES FOR CAPS & CLOSURES

适用于瓶盖和胶囊类产品

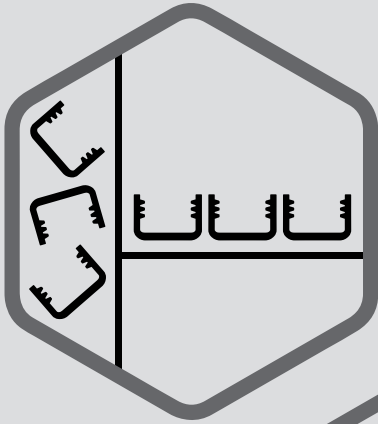
In-depth knowledge of materials, proprietary technologies for every stage of production and first-rate service. Discover the full range of SACMI post-processing solutions for caps and closures:

萨克米对材料深入了解, 拥有生产每个阶段的专有技术和提供一流服务。全面发现萨克米瓶盖和胶囊类产品后道加工解决方案:

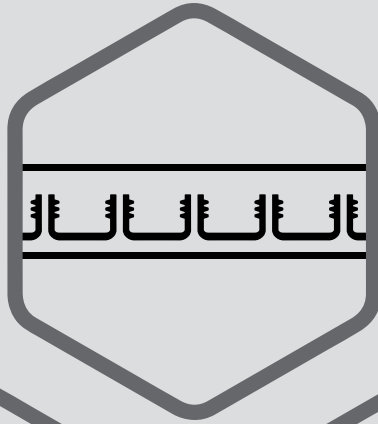
1. **PRODUCT HANDLING**
2. **SLITTING AND FOLDING THE TAMPER-EVIDENT BAND**
3. **PRODUCT INSPECTION**
4. **CHECKING AND INSPECTING THE TAMPER-EVIDENT BAND**
5. **CAPS AND CLOSURES ASSEMBLY**

1. **产品处理**
2. **切环和折边**
3. **产品检测**
4. **防盗环检测**
5. **组装瓶盖及胶囊类产品**

SORTING
理盖



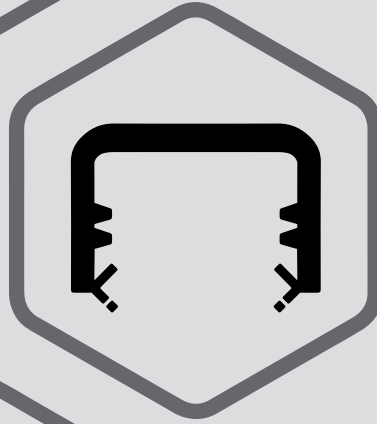
TRANSFERRING
输送



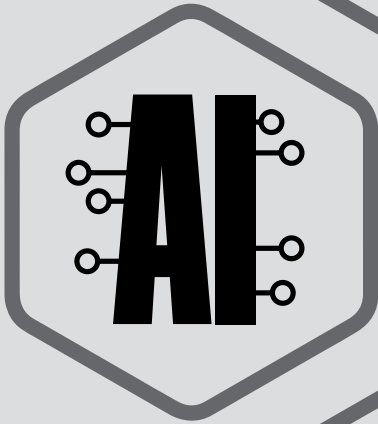
SLITTING
切环



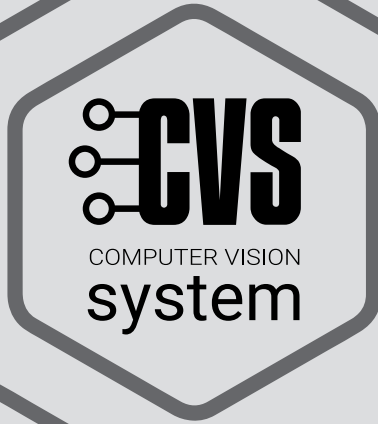
FOLDING
折边



**ARTIFICIAL
INTELLIGENCE**
人工智能



VISION SYSTEM
视像检测系统



ASSEMBLING
组装设备



Product handling

WE SOLVE YOUR PROBLEMS BY INTEGRATING ULTRA-ACCURATE EFFICIENT HANDLING FOR ANY CAP OR CLOSURES

THE TECHNOLOGY

We provide cap and closures handling solutions that safeguard quality and ensure a continuous feed to machines on the production line.

We solve your problems both by working alongside other leading companies in the sector and supplying proprietary applications.

Whatever your high or low speed conveying needs, SACMI provides close support in the form of highly effective, affordable plant engineering solutions.

ADVANTAGES FOR THE CUSTOMER

REDUCED CLEANING AND MAINTENANCE TIMES thanks to user-friendly access and a design that is extremely compact in relation to output.

Cap feed rate **UP TO 240,000 PCS/H.**

DURABILITY: all parts subject to worker intervention are hard-wearing; many components require no wrenches or tools to be disassembled.

LOW NOISE LEVELS thanks to soundproofing components and silenced compressed air blowers.

产品处理

我们通过精确高效的瓶盖或胶囊整合方案来解决您的问题。

技术

我们提供瓶盖和胶囊处理解决方案，以保证产品质量并确保生产线的持续生产。

我们通过与该领域的其他领先公司合作和提供专有应用程序来解决您的问题。

无论高速或低速输送，萨克米都将提供以高效、实惠的设备工程解决方案来满足您的需求。

客户优势

因其简单的使用和非常紧凑的布局设计，**减少设备清洁和维护时间。**

瓶盖输送效率最高可达**每小时240,000个产品。**

耐久性：所有需要工人安装的部件都是长久耐磨的，许多部件不需要扳手或工具即可拆卸。

因其隔音组件和消音压缩空气鼓风机使**噪音水平等级降低。**



POST PROCESSING LINES



Feel free to contact us to obtain a tailor-made plant configuration

请随时与我们联系, 量身打造您的专属工厂。

Slitting and folding the tamper-evident band

切环和折边

WE MAKE YOUR MANUFACTURING EFFICIENT BY PROVIDING ULTRA-RELIABLE FLEXIBLE MACHINES THAT HAVE LONG BEEN THE INDUSTRY BENCHMARK

萨克米切环折边设备可靠灵活, 长期以来是饮料包装行业内的风向标。

THE TECHNOLOGY

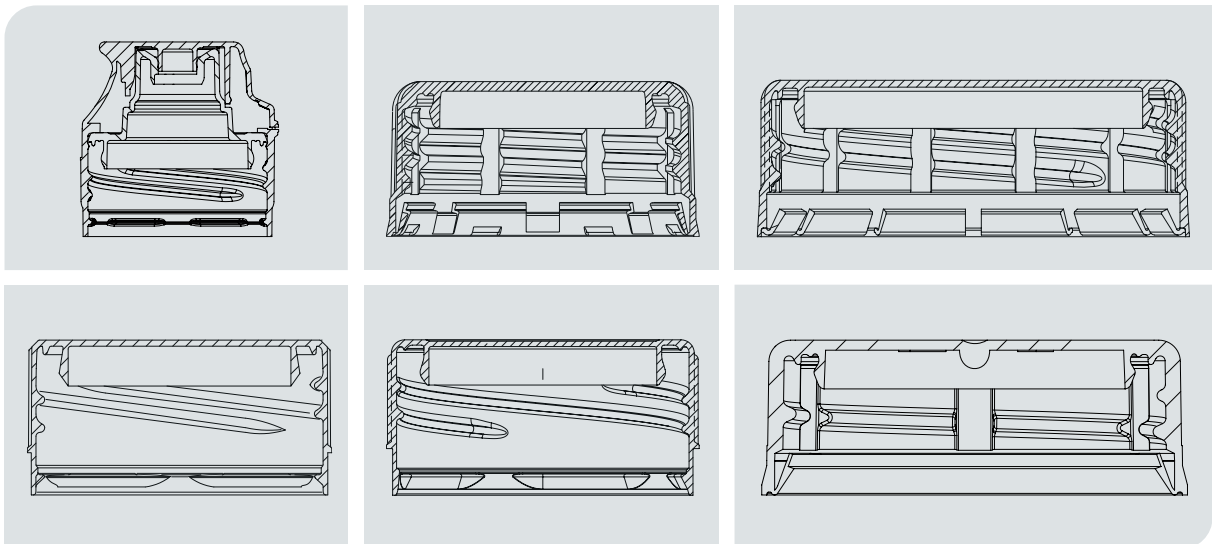
We help you choose the most suitable T.E. band for your cap.

You obtain maximum efficiency by combining the slitting and folding tasks on just one machine (SFM) or, when necessary, by using separate slitting (SCM) or folding (FLM) machines.

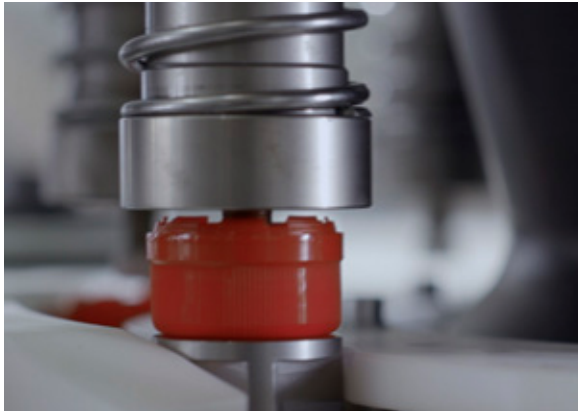
技术

我们帮助您选择最适合瓶盖的防盗环。

可以采用一台设备(SFM)完成切环和折边的工序, 或必要时, 采用单台切环设备(SCM)或折边设备(FLM)以优化产量。







ADVANTAGES FOR THE CUSTOMER

RELIABILITY, as demonstrated by hundreds of customers and thousands of installations worldwide.

OUTSTANDING FLEXIBILITY: the combi SFM can perform scoring and folding or folding and scoring processes according to cap morphology.

SIZE RANGE: $18 < \varnothing < 63(73)$ mm, $10 < H < 25$ mm.

OUTPUT UP TO 132,000 caps per hour.

UNBEATABLY FAST cutting tool changeovers.

PERFECT CUTTING REPEATABILITY thanks to spindle rotation via a dedicated servo motor.

ERGONOMIC DESIGN, making all components easy to access and cleaning-adjustment-size changeover tasks extremely simple.

NATIVE INTEGRATION with SACMI vision system, **IN-LINE INSPECTION**.

REMOTE SUPPORT via machine automation.

我们能够为客户带来以下优势：

可靠性: 通过全球数以百计的客户，以及数以千计的安装服务得到印证。

杰出的灵活性: 根据瓶盖需求切环折边设备SFM可兼具切环折边功能，也可单独进行折边或者切环。

尺寸范围: $18 < \text{直径} < 63(73)$ mm, $10 < \text{高度} < 25$ mm

产量高达132,000瓶盖/小时

换型简单快捷

切割重复性强，主轴通过专用伺服马达旋转，品质上乘。

符合人体工程学的设计，易于清洁和尺寸转换异常简单。

与萨克米(SACMI)视像检测系统整合进行在线检测

通过机器自动化进行远程服务支持

Technical specifications

技术规格

		切环折边机				切环机				折边机
		SCORING & FOLDING				SLITTING				FOLDING
		SFM08	SFM08	SFM12	SFM12	SCM08	SCM08	SCM12	SCM12	FLM12
			4 heads optional		6 heads optional		4 heads optional		6 heads optional	
			4头备选		6头备选		4头备选		6头备选	
Nominal max. closure diameter 额定瓶盖最大直径	mm	63	63	63	63	73	73	73	73	73
Max. closure height 瓶盖最大高度	mm	25	25	25	25	25	25	25	25	25
Output rate 产量	pcs/min	up to 1200	up to 600	up to 2200	up to 900	up to 1200	up to 600	up to 2200	up to 900	up to 2200
Average absorbed power 平均吸收功率	kW	6,5	8	8	8	3.5	3.5	3.5	3.5	3.5
Compressed air consumption at 0,5 Mpa 压缩空气损耗0,5巴	NI/min	230	230	230	230	230	230	230	230	230

Feel free to contact us to obtain a tailor-made plant configuration

请随时与我们联系以获得定制的生产配置



New SACMI slitting solutions

萨克米创新切环 方案

iSlit SETS A NEW STANDARD FOR TAMPER EVIDENCE BAND SLITTING BLADES, TAKING THIS WIDELY USED PROCESS TO A WHOLE NEW LEVEL

iSlit SETS, 即针对防盗环一系列全新切环方案, 以进一步优化加工工艺, 从而提高生产效率。

The SACMI range has three blade categories:

- **iSlit Standard**
- **iSlit Plus**
- **iSlit Top**

萨克米提供三种切环方案:

- **iSlit 标准切环方案**
- **iSlit 优化切环方案**
- **iSlit 高级切环方案**

The advantages are easily understood: longer-lasting slitting quality means fewer adjustments, thus reducing downtimes, making errors less probable and lowering the need for specialized personnel.

其优势易于理解: 更持久的切环质量意味着更少的调整, 从而减少停机时间, 减少错误发生的可能性, 并降低对专业人员的需求。

This highly innovative proposal confirms SACMI's leadership in the post-molding slitting process, further enhancing its role as the standard-setter for the plastic cap manufacturing industry.

萨克米, 作为塑料瓶盖领域切环标准制定者, 进一步加深对切环技术的理解和再创造, 为当代饮料包装行业提供前沿尖端的切环解决方案。



iSlit Standard is the SACMI blade recognized worldwide for its quality and durability. Now, thanks to next-generation treatment, its slitting life has been extended by up to 20%.



萨克米切环刀片以其质量和耐用性受到全球饮料包装市场好评，全新创新切环方案，即萨克米iSlit标准切环方案(iSlit Standard)，刀片的使用寿命延长20%。



iSlit Plus is the next step up. Thanks to a combination of various treatments, it offers a further extension of slitting duration with respect to the iSlit Standard.



iSlit优化切环方案(iSlit Plus)，采用多种工艺和各类处理方式相结合的方法，进一步延长刀片的使用时间。



iSlit TOP is the best-in-class tamper evidence band slitting blade. Made using innovative materials and treatments, it provides slitting performance that lasts up to twice as long as that of today's leading blades.



iSlit高级切环方案(iSlit TOP)采用创新材料和全新的处理方法提高切环性能，延长刀片使用寿命，从而使刀片使用时间是普通的两倍。



SFM
Scoring & Folding Machine
切环折边设备

For any molding technology

成型技术

Slitting and folding the TE band downstream of the molding machine makes the production line more flexible for both the polymer market and the consumer market.

Simply by replacing a few components, manufacturers can modify the behavior of the tamper-evidence band, leaving the most expensive components (i.e. the press mold) untouched.

This principle is valid for both molding techniques: injection and compression.

切环和折边设备使生产更灵活应用于原料和消费市场。

仅需少量部件即可调整防盗环性能，无需更换整套模具。

成型技术适用于注塑和压塑两种工艺。



PFMC
Pull Force Measuring machine
with vision system

拉力检测设备
配有视像检测系统

CHS
Cap Handling System

瓶盖视像检测设备

Product inspection

FEEDBACK FROM OUR INSPECTION SYSTEMS HELPS YOU OPTIMIZE YOUR PROCESSES, ENSURING YOU CAN COUNT ON PRODUCTS OF THE HIGHEST QUALITY

THE TECHNOLOGY

The SACMI CVS vision system is renowned worldwide for its performance, flexibility and user-friendliness.

The version shown here (**fig.1**) incorporates a set of solutions that perform:

- Inspection of the product side of the cap
- Inspection of the cap body
- Inspection of the outer side wall

The first image grab inspects the inside of the cap, checking for defects on the plug seal and thread, such as burr, deformation, voids, contamination or black spots. (**fig.2**)

A second image grab detects any defects in the cap structure or tamper-evident band. Such defects include ovalization, breakage or incompleteness of the band, burr, color variations and contamination. (**fig.3**).

The system also provides approximate measurements of inner and outer cap diameters and the plug-seal diameter.

What's more, since it recognizes the cavity number of the mold that produced the cap, the system tracks cavity-related statistics, warnings and rejects.

产品检测

来自检测系统的产品反馈信息有助于优化生产线，为产品质量提供可靠保障。

技术

萨克米视像检测设备以其卓越性能和高效灵活受到全球饮料包装市场赞誉。

适用于检测产品缺陷包括：

- 检测瓶盖内侧壁
- 检测盖身
- 检测产品外侧壁

设备捕捉到的第一帧图像画面用于检测瓶盖内部缺陷，包括内塞和螺纹，如毛边、变形、空隙、污染或黑斑。

设备捕捉到的第二帧图像画面用于检测瓶盖结构和防盗环，如椭圆、防盗环断桥、防盗环完整性、毛边、色差及污染。

萨克米视像检测设备还可用于测量瓶盖内外直径和内塞直径。

此外，萨克米视像检测设备具有识别模号的功能，便于系统跟踪与模腔有关的生产参数，并及时发出预警信号和剔除瓶盖。



1



2



3

This information lets manufacturers intervene upstream from the process, either via automatic machine adjustments or by providing the operator with suggestions on how to act on the relative process parameters.

EXTERNAL SIDEWALL INSPECTION

The external side wall is inspected using 4 cameras positioned 90 degrees to each other. Using sophisticated 3D algorithms developed by SACMI R&D, the system 'unfolds' the side wall of the cap to produce a 2D image that compensates for any deformation caused by optics, perspective or spatial position. The system can then use this image to detect defects such as tiny black spots, contamination, scratches or groups of broken bridges.

Additionally, this system lets manufacturers take indicative measurements of cap diameters at multiple points on its height, and check for any unfolded tamper-evident band lugs.

ADVANTAGES FOR THE CUSTOMER

- Perform all inspections via a single control panel.
- Integration with machines on the line (through both statistical and operational data connectivity) and with individual process tools.
- Ease of use thanks to the most intuitive HMI on the market.
- Reliability and inspection accuracy guaranteed by experience gained from thousands of installations worldwide.
- Remote assistance for all operational/corrective needs.

此类信息有助于生产商从加工环节及时发现生产中的问题，通过设备自动或操作人员手动调整相关生产参数即可解决。

产品外侧壁检测

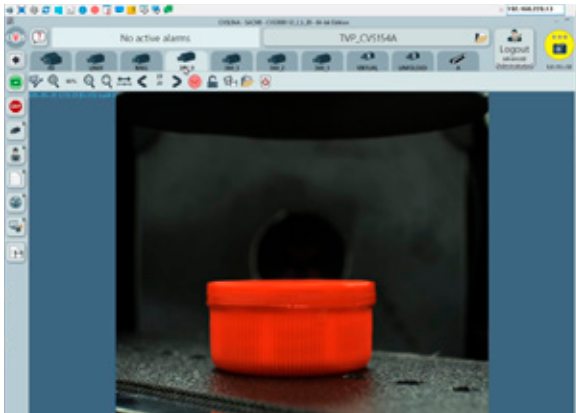
采用四个相互呈90度的摄像头检测产品外侧壁。萨克米研发中心开发的3D成像技术，即瓶盖侧壁平铺后生成二维图像，以减少因光学、透视或空间位置产生的变形。视像检测系统可以检测产品缺陷包括黑斑、污染、刮擦及防盗环断桥。

视像检测设备可用于对瓶盖进行直径多点测量，也可检测未折边防盗环叶片。

产品优势

- 独立控制平台实现品控。
- 数据统计和生产参数与设备可以完全连线，包括针对单模实时统计生产参数。
- 人机界面(HMI)易于操作。
- 视像检测设备受到全球饮料包装市场的广泛好评，为产品质量保驾护航。
- 远程支持随时为用户排忧解难。

POST PROCESSING LINES



Checking and inspecting the tamper-evident band

SAVE TIME AND MONEY WITH THE PFMC (*PULL FORCE MACHINE CVS-CUT*):

- FAST AND RELIABLE BRIDGE BREAK TESTING
- AUTOMATIC CORRECTION OF WORKING PARAMETERS ON SLITTING MACHINE

The PFMC control machine provides a dual advantage: it saves manufacturers considerable time when testing for broken bridges and simultaneously lets users automatically correct some of the working parameters on the slitting machine.

Slitting quality is always consistent and unaffected by human factors.

THE TECHNOLOGY

The purpose of the PFMC is to:

1. measure the tamper-evident band breaking force
2. inspect the T.E. slit

1. BREAKING FORCE MEASUREMENT

This machine performs destructive checks on selected cap samples.

It can work as either a stand-alone unit or on a production line.

防盗环检测

拉力检测设备PFMC- 省时&低成本

- 快速可靠的断桥测试
- 切环设备可全自动校正运行参数

拉力检测设备PFMC提供双重优势: 节省制造商测试断桥时间, 同时设备可自动校正切环设备的运行参数。

切环质量保持稳定, 不受人为因素影响。

技术

拉力检测设备PFMC的用途:

1. 检测防盗环桥点拉力
2. 检测防盗环切环

1. 桥点拉力检测

对瓶盖样品进行桥点拉力检测。

可以在独立式设备或在生产线上取样。



At set intervals, the machine takes a sample of caps from the slitting machine outlet chute (usually once per carousel revolution).

A pull test is performed on these samples to measure:

- bridge breaking forces
- the breaking force of the lugs that keep the cap tethered to the bottle

The machine records the detected values and provides a set of statistics associated with the individual slitting machine spindles. It also produces graphs showing force as a function of time, and can export that data via Ethernet or USB.

By analyzing the graphs indicating force over time, manufacturers can assess lengthening of the bridges; this is useful, for example, when carrying out comparative tests of caps manufactured with different materials.

ADVANTAGES FOR THE CUSTOMER

- Suitable for both traditional tamper-evident band caps and tethered caps. With just a few modifications to its components, it can also measure the breaking force of the band lugs axially.
- A quick size changeover lets the machine measure bridge breaking force on caps of different diameter.
- Statistics linked to values measured for each single spindle of the cutting machine.
- Feedback to adjust blade temperature, thus compensating for wear and keeping slitting quality constant.
- Pull force checks, performed at regular intervals during production, allow indirect detection of:
 1. whether the scoring blade has worn and/or whether the used scoring parameters are suitable or not

在设定的时间间隔内, 该设备从切环折边设备输送带出口槽取样(每旋转一次取一次样品)。

拉力测试主要用于测量:

- 桥点拉力
- 保持瓶盖与瓶口相连的脱盖力

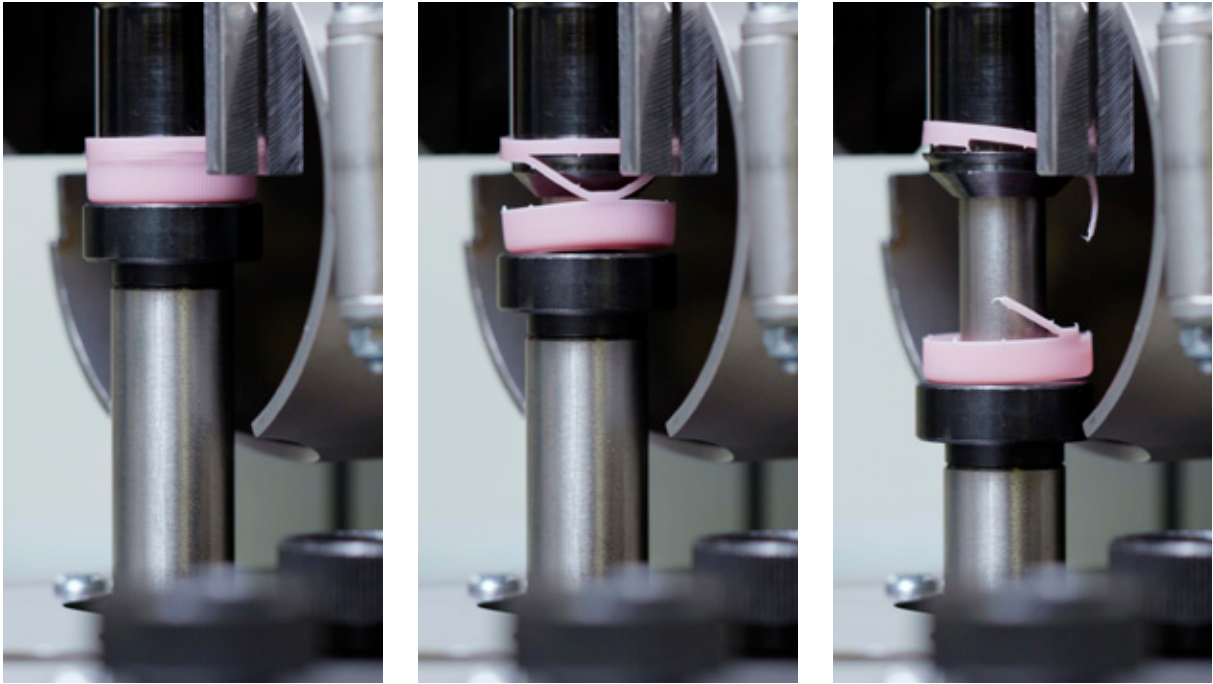
该设备会记录检测到的数值, 读取切环折边设备的生产参数, 随时间变化形成拉力图表, 可通过以太网或USB导出已生成的数据。

通过分析显示随时间变化的拉力图表评估连接桥长度; 对不同材料的瓶盖进行对比测试, 这是非常有用的。

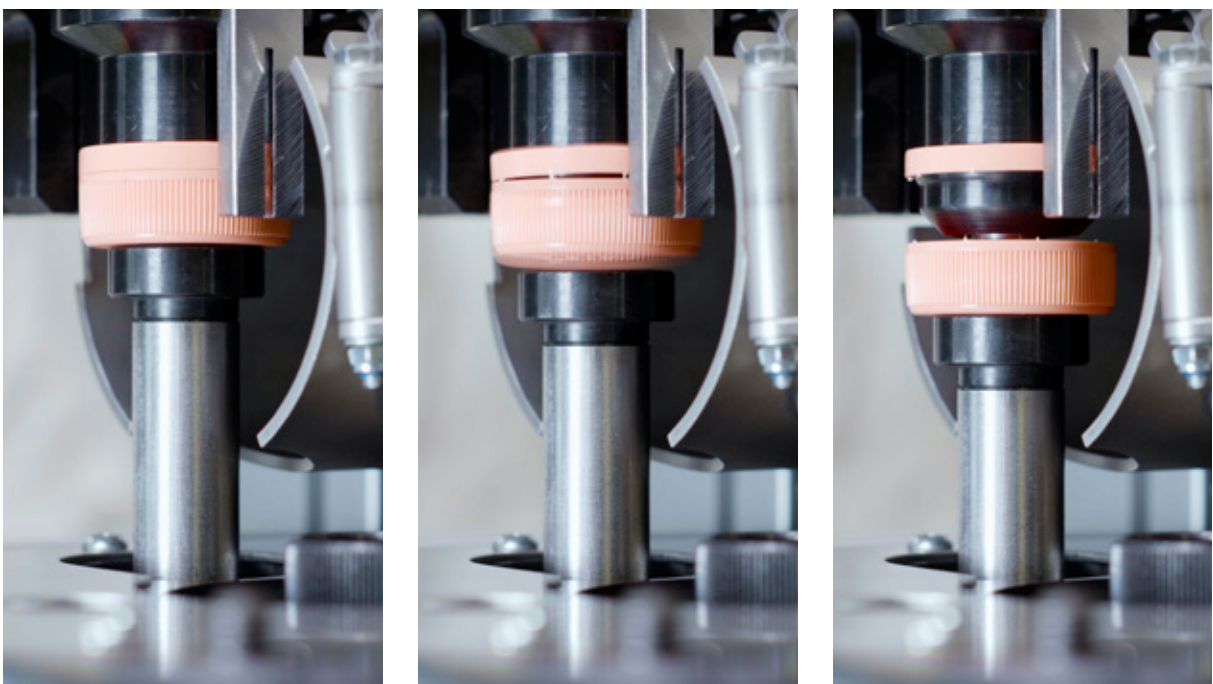
优势

- 既适合传统型防盗环也适合连环盖。只需对部件进行少许修改, 即可测量防盗环桥点拉力。
- 尺寸更换简单快速, 该设备可以测量不同盖型的桥点拉力。
- 可读取切环机动刀头的生产参数。
- 通过对刀片温度进行控制可以避免因刀片磨损而导致对产品质量产生的影响, 从而确保切环质量的一致性。
- 在生产过程中定期进行拉力检测, 可以执行如下检测:
 1. 切环刀片是否已经磨损和/或切环参数是否适用。

Tethered cap



Traditional tamper evidence band



2. whether the cap material is unsuitable or incorrect

2. SLIT INSPECTION

The PFMC machine is supplied with an inspection system (CVS CUT); this is an integral part of the machine and inspects the tamper-evident band before the destructive test.

This particular inspection system features a high-resolution monochrome linear camera, capable of capturing the cap profile at a resolution of less than 0.01 mm/pixel, thus ensuring high-precision inspection of the tamper-evident band slit.

ADVANTAGES FOR THE CUSTOMER

- Accurate control of cutting tool performance, compensating for their decay (i.e. by acting on their temperature).
- This latest-generation inspection system operates at a level of detail unattainable with traditional cameras and opens up new horizons in the self-adjustment of processing machines on the basis of actual slitting quality.
- Extremely accurate inspection of:
 1. band quality: black spots and incompleteness
 2. slitting quality: straightness and thickness
 3. bridge quality: size, consistency and quantity

2. 瓶盖材料是否适用或不恰当

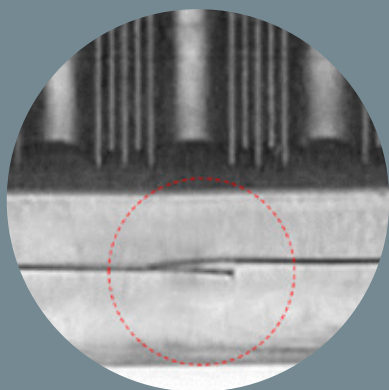
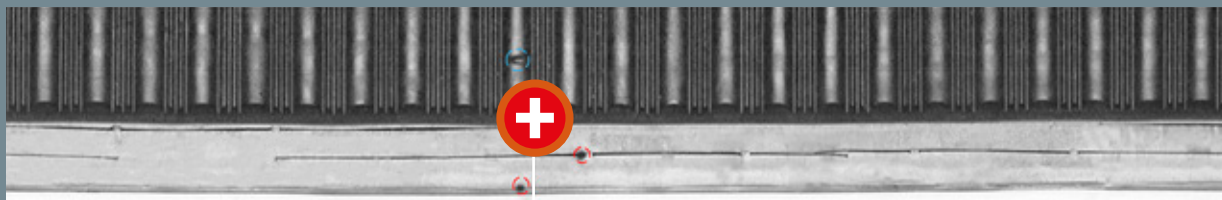
2. 切环检测

拉力检测设备PFMC配有视检测检测系统CVS CUT, 用于在断桥检测前检测防盗环。

视像检测设备配有高清单色摄像头, 以低于0.01毫米/像素的分辨率捕捉瓶盖的轮廓图像, 从而检测防盗环质量。

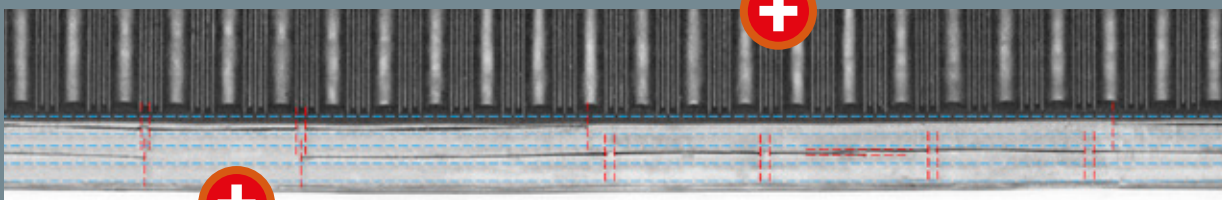
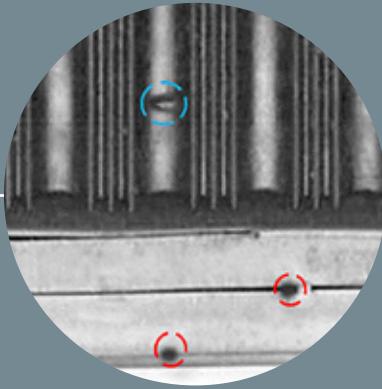
优势

- 精确控制切刀性能, 充分弥补缺陷(如调整温度)。
- 在防盗环品控方面, 新一代视像检测设备可以对整个检测过程进行自动调整和控制, 突破传统检测方案, 无疑是一大全新亮点。
- 精确检测:
 1. 防盗环质量: 黑斑及完整度
 2. 切环质量: 平直度和厚度
 3. 连接桥质量: 尺寸, 一致性和数量

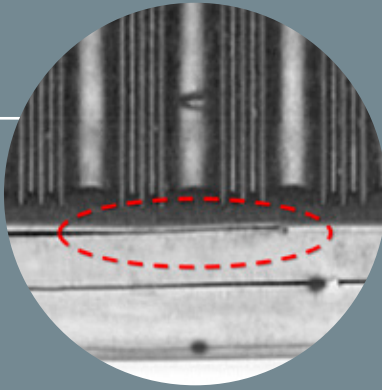


Blade chip detection 切刀检测

Detection of incorrectly mounted fixed tools 检测定刀是否安装准确



Detection of correct slitting junction 检测切环连接



Cap and closure assembly

A TYPICAL ASSEMBLY LINE CAN PROCESS AND ASSEMBLE UP TO 12 OR MORE COMPONENTS, COMBINING CUTTING, EMBOSSING, MOLDING, SILICONIZING, CRIMPING AND DEFORMING TASKS

THE TECHNOLOGY

Custom assembly lines or cascade arrays made up of more than one assembly line are built when multiple components need assembling or specific assembly tasks need to be performed.

Output rates vary according to closure type and the customer's needs, and may be as high as 1,500 parts per minute. The used technology depends on the application: to assemble products made up of different 'families' of closures we produce both modules for index machines with fast tooling and continuous-motion lines where assembly speed is the key element.

All assembly lines can be equipped with vision systems for quality control of the individual components or the finished product.

The machine itself can be connected to the company ERP/MES for accurate inline management of work orders, workload, product output and statistics.

All machines can be remotely monitored and serviced (as per customer requirements and security polices).

组装瓶盖及胶囊类产品

一条典型的装配生产线可以加工和装配多达12个或者更多组件，结合了切割、压花、成型、涂硅、折弯以及变形的需求。

技术

当装配多个组件或需要执行特定装配任务时，需要构建多级级联排列生产或由多条装配线组成的自定义装配生产线。

产量因瓶盖类型及客户需求而有所不同，最高可达1,500组组件/分钟。所使用的工艺取决于瓶盖的应用：为了组装不同系列的瓶盖产品。快速组装包括步进式和连续式两种生产模式，其中装配速度是关键因素。

所有装配线都可配备视像检测设备，用于单个部件或成品的质量控制。

机身可以连接至公司的ERP/MES系统，精准在线管理订单、工作量、产品数据的导出以及统计。

根据客户要求和安全政策，设备支持远程监控和服务。



ADVANTAGES FOR THE CUSTOMER

HIGH PRODUCTION SPEED

The assembly lines are designed to provide high output rates, with innovative solutions ensuring customers get the fastest possible return on investment.

HIGH LINE EFFICIENCY

Over the years, the R&D department has developed highly reliable solutions that guarantee excellent durability, minimizing maintenance. Furthermore, high-precision assembly operations ensure waste is minimized, increasing the line efficiency.

LOW TCO (Total Cost of Ownership)

Having a high-speed assembly line, with minimal downtimes and low percentages of product waste, gives customers the lowest possible processing costs, maximizing profits.

OVER 30 YEARS OF EXPERIENCE

For more than 30 years, Velomat assembly solutions have responded to the needs of even the most demanding customers. Over 1,500 assembly platforms have been installed worldwide with some of the most renowned players on the global market.

优势

高速运行

装配线旨在提供高产量、创新的解决方案，确保客户获得最快的投资回报。

高效生产

多年来，研发部门致力于不断探索可靠高效的解决方案，提升设备耐用性的同时，减少设备维护的时间。精确装配方案可以减少浪费，进一步提高生产效率。

整体拥有成本(TCO)低

一条高速装配生产线可以进一步减少停机时间，降低产品浪费率。较低的加工成本可以进一步提高利润率。

超过30年的产品经验

在超过30年的时间里，Velomat组装解决方案能满足客户需求。全球已安装超过1,500个台装配设备，包括全球市场上的大型公司。



