

Technologies & Manufacturing Equipment

**The specialist for any
visual inspection
requirement**

SG Stevanato Group

MANAGING COMPLEXITY, DELIVERING VALUE

From product development to large-scale production



Manual Equipment

A Bench Vision Unit has been developed to provide maximum flexibility, with the same software and component design as our automatic visual inspection equipment.

Our benchtop unit is designed to inspect different containers and products:

- Container range:
ampoules, vials, cartridges, syringes
- Inspected products:
water-like, viscous, suspensions

Semi-automatic equipment

Our semi-automatic PWL Series inspection machines are designed to overcome the challenges associated with manual inspection processes, providing greater ease of use for operators. The PWL Series is designed for simple and effective inspection of vials, ampoules, cartridges, and syringes containing injectable liquids, powders, or freeze-dried products. Handling systems can speed up the inspection for smooth integration into the production line.

VRU

The Vision Robot Unit (VRU) takes inspection to a new level. It is a robotic human-like inspection unit, combining flexibility with automation efficiency. It also features artificial intelligence (AI)-based machine learning capabilities. The VRU is a reliable, autonomous island machine, capable of fully automated inspection (cosmetic and particles) without human intervention.

Visual Inspection



Your product is in safe hands with us

We have a consolidated expertise in parenteral drug inspection, including liquid, powder and lyophilized products.

We can provide **inspection for any glass or plastic containers** filled with **clear or dark liquids, emulsions, viscous, gel-like products, suspensions and lyophilized products**.

We continuously innovate our processes and pioneer new technologies to offer our customers best-in-class

solutions.

Our **portfolio** of visual inspection solutions can **cater for the needs** of small biotech firms who require maximum flexibility or **large manufacturers** producing "blockbuster" drugs.

Automatic Equipment

We offer a comprehensive range of automatic inspection machines for injectable pharmaceutical products contained in ampoules, vials, cartridges, syringes and bottles. Designed and

manufactured to meet the most demanding technical requirements, our solutions feature different production speeds and advanced vision standards for optimum performance.

Easy and Plus Series

Up to 400pcs/min

Easy Series are user-friendly vision inspection machines, easy to operate and to maintain.

Plus Series is the first choice for complex liquid or lyophilized pharmaceutical compounds. Large format glass and plastic bottles can be processed.



MAVIS® platform

Up to 400pcs/min

Mavis® Platform is an automatic vision inspection unit for syringes, vials, cartridges, and ampoules.

It guarantees superior inspection of particulates, cosmetic defects, and closure integrity. It combines advanced inspection performances within a small footprint.



CVT Core and CVT Series

Up to 800 pcs/min

A unique technology to achieve a market-leading performance in terms of high detection rate while maintaining a low false rejection rate thanks to the use of Line Scan Cameras, Matrix Camera and High-Voltage Leak Detection.

This line has been devised to process highly valuable drugs to the highest inspection speed.



Your Visual Inspection Specialist

Your requirements, our technologies

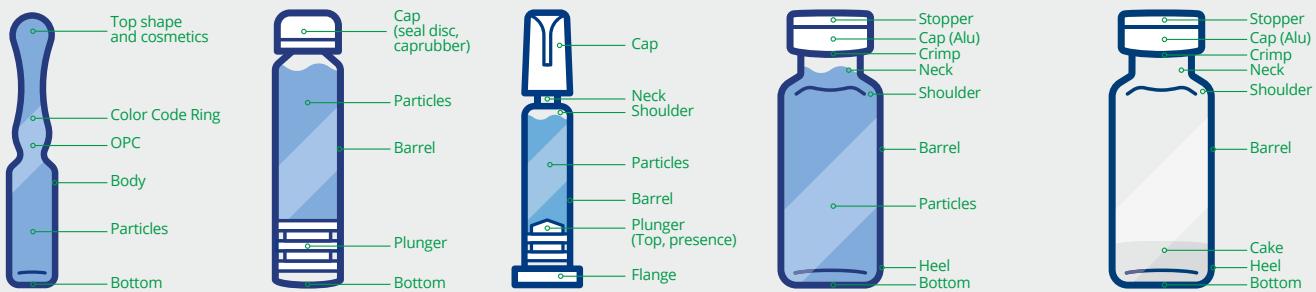
Our inspection capabilities

Particles and cosmetic defects, closure integrity and fill level.

Take advantage of:

- Technology leadership
- High efficiency and reliability
- Lowest false reject rates

- Tailored user-friendly equipment
- Coverage of full range of inspection: particulate matters, closure integrity and cosmetic defects



High Voltage Inspection

Leak Detection, liquid products (HVLD)
Needle Shield Inspection (HVNSI)

Laser Absorption Spectroscopy

Leak Detection, lyo products (HSA)



There's nothing artificial about our intelligence

Inspecting pharmaceutical drugs with automated visual inspection systems is a well-established process.

However, the rule-based method can be challenged by variations in containers, product appearance or other production factors.

This results in costly false rejects.



Unlocking the Potential of Artificial Intelligence

Empowering the machine vision system with **Deep Learning** models **successfully addresses this challenge**, decreasing the false rejection 10x while increasing the detection rate up to 99.9%, without affecting any other aspects of machine performance or container handling.

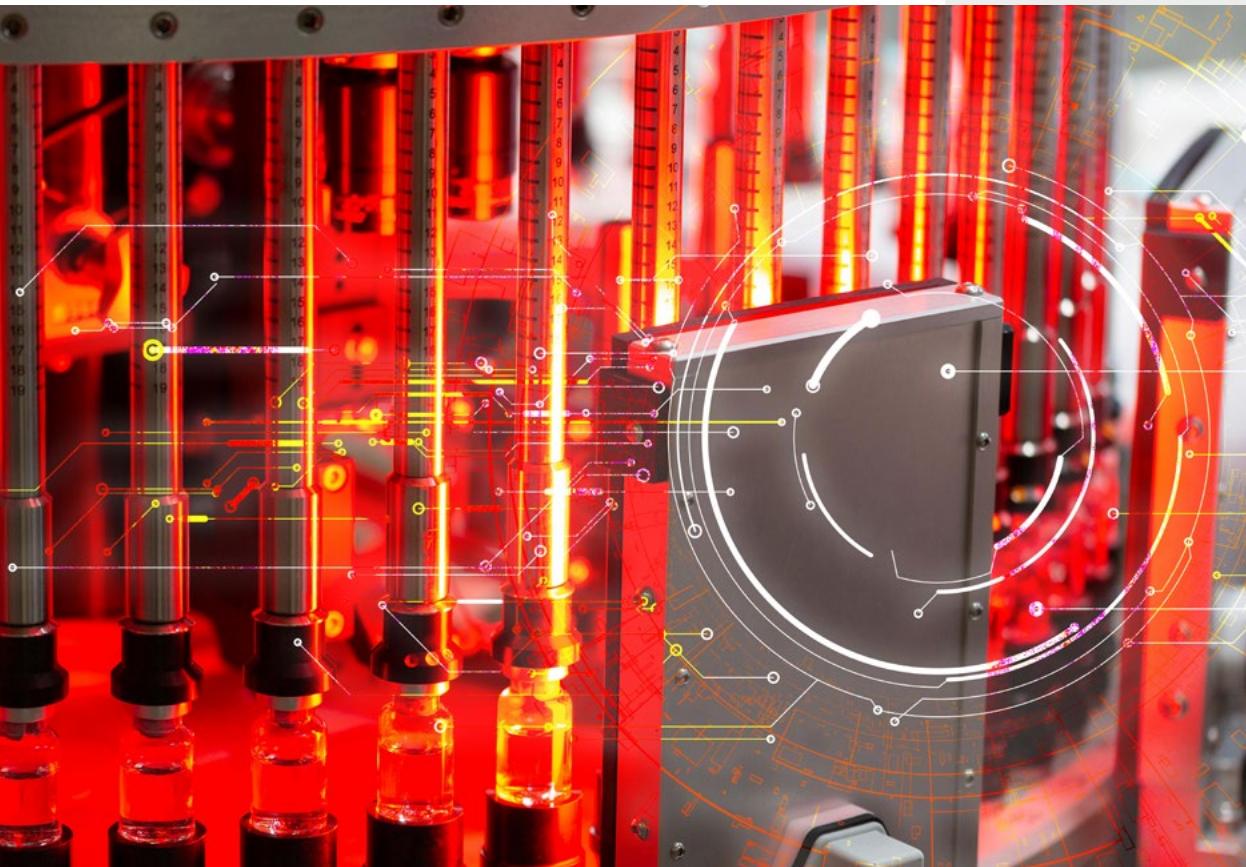
99.9%



Achieve up to **99.9%** defect detection accuracy



Reduce false rejects by ten-fold



SG Vision AI: Combining technology with expertise

SG Vision AI offers a secure cloud-based platform to deliver enhanced performances for both particle and cosmetic inspection. Customers will benefit from **cutting-edge tools based on Microsoft Azure platform and continuous support by a skilled vision and AI engineering team**, who will accompany users throughout the process.

Compliant with the tight standards required by the pharmaceutical industry, SG Vision AI ensures:

- Secure image upload, sharing and labeling
- Data integrity and traceability
- User-friendly operations
- Advanced model performance evaluation

Why using Deep Learning models for pharma inspection?



Minimize the total cost of ownership



Increased detection rate for defects



Avoid re-inspection of grey items

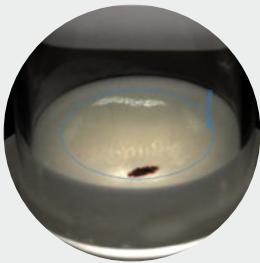


Shift to a predictive model to monitor process flow



Increased control over defects classification

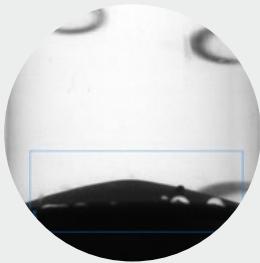
Best-suited applications



Lyo cake inspection



Suspension inspection



Air bubbles vs particles



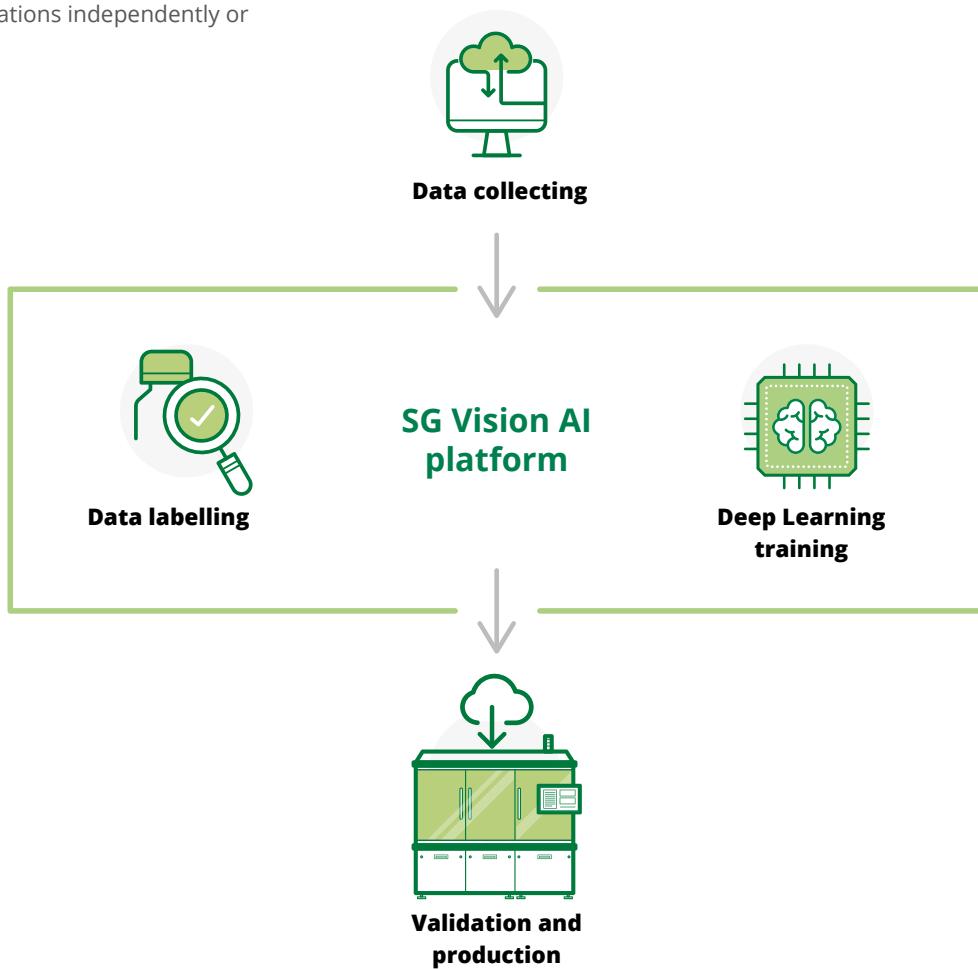
Cosmetic defects

How does it work?

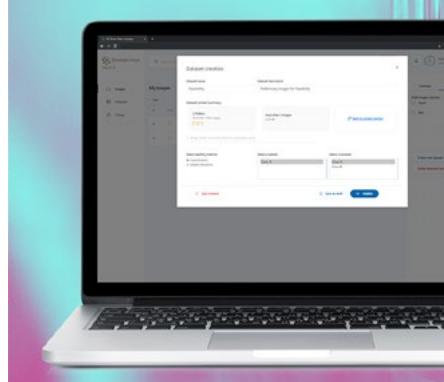
Adopting **Deep Learning** in the inspection of your pharmaceutical products is going to be straightforward.

The platform is designed to provide an **intuitive, user-friendly experience**: you can run the operations independently or

rely on our dedicated team. We offer our expertise to support and **guide you to make the most of this new technology**.

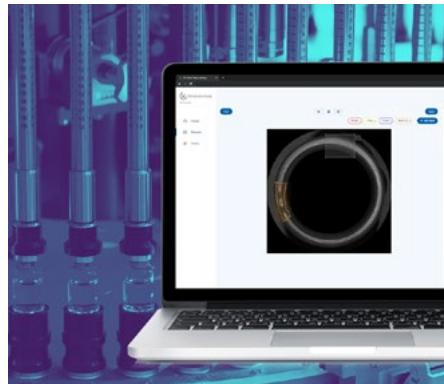


SG Vision AI



Data collection

Any AI system output is only as good as the quality of the data it receives. With years of experience in machine vision software algorithms, Stevanato Group machines can provide good quality images through high-resolution cameras and accurate optical setup. The easy-to-use graphical interface guides the user to collect the images and upload them on the platform seamlessly.



Deep Learning training

We train and develop the Deep Neural Networks (DNN) to optimize inspection results. Using the most advanced tools and leveraging the system's automatic computing power calculation, we are committed to delivering the best performing models, tailoring them to your requirements.

Data labelling

The software enables data labeling to classify defects and train the Deep Learning model. We use industry-leading solutions to secure full data traceability and integrity throughout the process, for example, the system generates a unique fingerprint for each data set. Smart assistance is available to transfer your knowledge to the system and label images.



Validation and production

The deployment phase entails a similar approach to the current pre-production methods. Once the model is frozen at the end of the virtual operational qualification, you can download the "validated" model, install it on the automatic inspection machine at your site and start production.



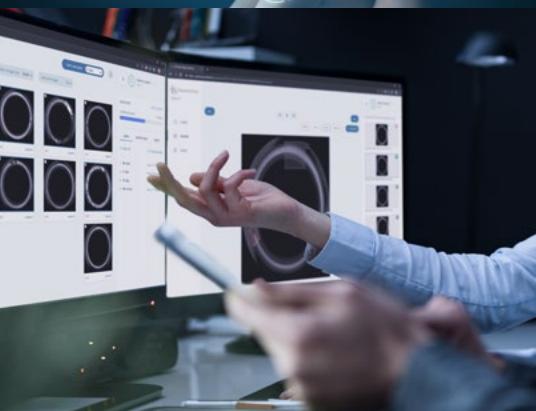
CLOUD-BASED

Your data are always online and available. The certified cloud-based platform that stores images and data can work with any other cloud-based or on-premise system, allowing operators to handle images even if they are stored in the server.



SECURITY

Compliant with U.S. CFR 21 Part 11 and EU GMP Annex 11, the platform
- based on Microsoft Azure platform
- enables data sharing in a completely safe environment. Further, multifactor authentication and encrypted communication ensure complete access control and data security.



USER-FRIENDLY

Stevanato Group's AI platform provides a seamless user experience with an easy-to-use Graphical User Interface for data lake uploading, labeling and tool management.



ASSISTANCE

Continuous support is available for all platform capabilities throughout the process. Our experts assist you with a variety of tasks, including a labeling assistant tool to optimize timing for classification and new recipe development



MONITORING

The platform features a wide range of statistics and visualizations (heat maps, confusion matrix, etc.) for model performance evaluation. You can track and monitor all processes through reports.

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**Global presence with operating units
and commercial offices in 10 countries.**

Visit our website to contact us.



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