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harle2D|3D_

2D AND 3D VISION SYSTEM FOR ORAL SOLID PRODUCT

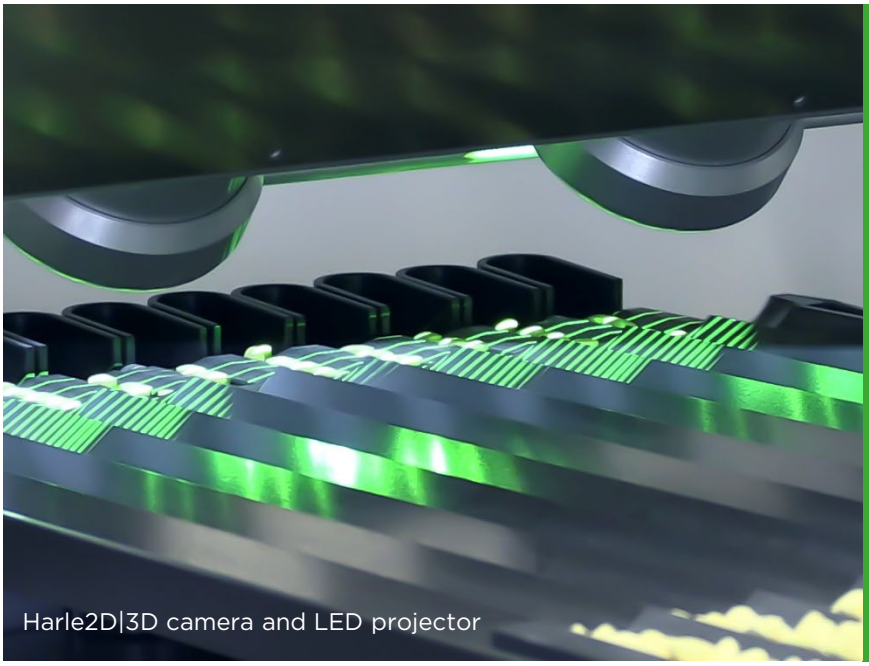
SEAVISION

Vision Inspection Systems and PAT tools

Harle2D|3D is the vision systems designed for the inspection of solid dose products on filling & counting or thermoforming machines.

Harle2D|3D system is capable to check capsules and tablets in **three dimensions** and detect invisible errors for traditional two-dimensional vision systems.

- Control in 3 dimensions over 100% of the products
- Grants product integrity and avoid mix-up
- Operations executed in real time
- High precision
- Single product rejection management



Harle2D|3D camera and LED projector

Harle2D|3D add a dimension to the control on tablets and capsules

Harle2D is designed to check oral solid product **dimensions, shape and colour**.

Harle3D is designed to check **product thickness**.

Harle2D|3D effectively identifies any type of defect, giving the machine the input to discard single products that are not compliant.

Harle3D can be installed only in combination with harle2D.

Harle2D/3D can be also combined with harleNIRc for the chemical inspection of the product.

Able to **control 100% of the product** during the packaging process, it guarantees the highest quality of production, eliminates any risk of mix-up to preserve the safety of the end user.

The **3D control** allows the identification of errors that are impossible to find for a traditional 2D system such as a **decapped tablet** that shows the undamaged side to the camera. Harle3D thanks to a system of LED projectors is able to **control the height** of each product that passes under the cameras, adding a dimension to the control.

It is designed to **minimize waste**, limiting it only to truly non-compliant products with absolute precision and reliability.

Harle2D | 3D can be installed on any type of filling and counting and thermoformer machine on the market today **without impacting production speeds** and **integrating perfectly** thanks to the automation logic it is supplied with.

The use of **totally proprietary algorithms** and dedicated instructions allows harle2D | 3D a smart use of the **latest generation hardware** resources and guarantees real time controls measurable in milliseconds.

To ensure perfect control for each specific application, material or machine configuration, harle2D | 3D is supplied with the **optimal combination of optics and LED illuminators** depending on the product to be treated.

Materials

Optimal controls over each product and material

Harle2D|3D can control oral solid products:

- White and coloured tablets
- Uncoated tablets and pills
- Capsules - monochromatic
- Capsules – bicolored

The result is always optimal.

Capsules (one with different colour)

Tablet (one decapped tablet)

Controls

Control every detail of your production

2D CONTROLS - QUALITY OF THE TABLET
- Size;
- Colour;
- Shape;
- Integrity (broken or chipped tablet);
- Coating imperfection.

2D CONTROLS - QUALITY OF THE CAPSULE
- Size;
- Colour (monochromatic and two-color capsule);
- Shape (excessively closed capsule, excessively opened capsule);
- Integrity (open capsule, half capsule).

3D CONTROLS - QUALITY OF THE PRODUCT
- Product height control;
- Decapped tablet identification;
- Identification of crushed capsule.

Harle2D|3D HMI on touch screen display

Single product rejection management

Harle2D | 3D inspects **100% of the production** and is able to detect all possible defects on solid products, thanks to the wide range of controls it offers.

From the correctness and integrity of the single product, all **controls are customizable** and can be carried out individually or in simultaneous combinations.

The system is designed to **detect even minimal differences** in size, shape and colour.

Every single **product is tracked during transport** up to the reject position. This allows the best reject management according to the automation level of the machine, even the **rejection of the single product**.

Thanks to the **multi-product management**, it is also possible to made checks on products that can assume **different positions on the vibrating plates**.

Specifically developed algorithms allow to **segment and control** products that touch each other on the vibrating plates.

Software

Software features

The system is based on the use of cameras for the acquisition of product images which the software elaborates in **real time** by performing complex search operations, measures and comparison with reference models and tolerances. Depending on the result, the system **automatically communicates the rejection signal** for wrong products to the machine.

The design method is of the upmost importance for the productivity of the entire system: fast, reliable, harle2D is equipped with **smart algorithms** that takes full advantage of the installed hardware in order to severely **reduce the elaboration time** of the images, guaranteeing a **precise and secure result** at all times.

The development of **proprietary algorithms** significantly **reduces the image processing time**. The **spatial and temporal parallelization** of operations allows the efficient utilization of every CPU core and thread, resulting in **significant computing performance improvements**.

The elaboration of the calculation time is measurable in milliseconds and allows harle2D|3D to perform controls **without effecting the machine speed** in any way.

The display clearly shows the results of every single control **in real time**, allowing the operator to have a **complete set of production data** that is always under control.

The system is **expandable** and additional controls can also be integrated in a latter time.

Hardware

Hardware features

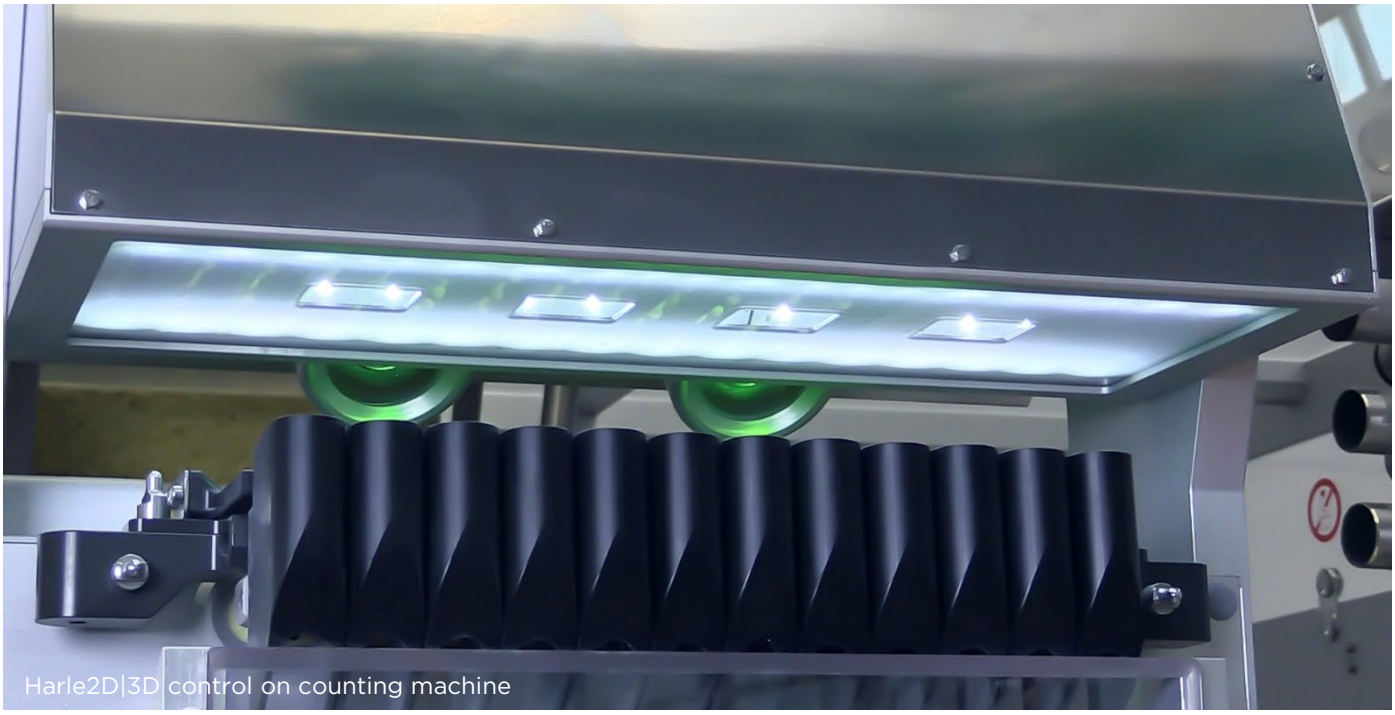
Excellent software requires proper hardware. SEA Vision uses only **latest generation** components, such as **industrial computers** with **multicore**, **multithreaded** processors that are fully utilized by **proprietary algorithms** and instructions.

The optics and the light units are specifically designed and assembled to adapt to the requested controls and to the specifications of the machine they are integrated into, always guaranteeing an optimal result.
The image acquisition is quick and precise with an **optimized lighting management**.
All used displays are touch-screen with an optimized interface that increases usability and interaction.

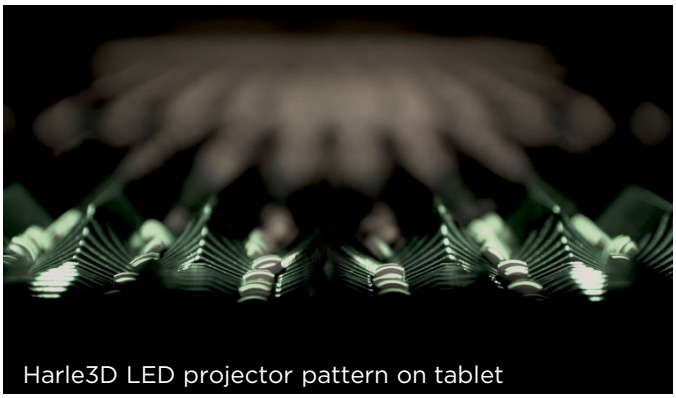
River industrial PC

Machine integration

Perfect machine integration, result of a wide experience.


Harle2D|3D control on counting machine

Single product rejection management


Harle3D LED projector pattern on tablet

A perfectly integrated solution

SEA Vision has a **strong experience of integration** of vision systems on machines with different levels of automation.

Such a **wide and matured experience** guarantees a **correct machine integration**, an **accurate signal exchange** management and integrated automation and **rejection logics**.

The **graphical oscilloscope** allows the observation of signal patterns and to keep them under control, facilitating the diagnostical operation.

The entire process is handled efficiently, from the execution of the control to the rejection of the defective product.

Compliance

Pharma specific

Specifically designed for the pharmaceutical field, the system is entirely compliant to all industry regulations.

User access is regulated in accordance with the FDA regulation 21 CFR part 11.
All events are registered in an audit trail file.
Software development is compliant with the Gamp 5 regulation.

Harle2D|3D HMI on touch screen display

The optimized touch display makes for a simple and intuitive use.

yudoo_

Native integration with SEA Vision systems

Harle2D|3D is a solution that natively integrates with trackability systems and with Yudoo, the 4.0 software suite for the centralized production management.

SEAVISION

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