INSPECTRA

MACHINE VISION EQUIPMENT

Machine vision solutions
for the food industry

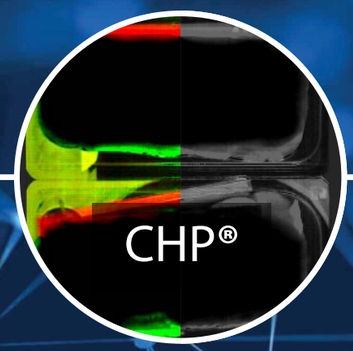
www.inspectra-vision.com

Our vision technologies

High-speed vision and performance

Our high-speed **INSPECTRA HSP®** technology enables us to offer **the fastest in-line inspection speeds** on the market. Our extensive experience in developing innovative inspection equipment for the most demanding production processes in the food industry has allowed us to develop and optimise the most advanced processing hardware and software architectures. We include parallelisation technology with an efficient distribution of processing threads with state-of-the-art hardware.
The high speeds and performance of our equipment allow us to process and act in **very short times** with rejection systems.

Hyperspectral - monospectral vision

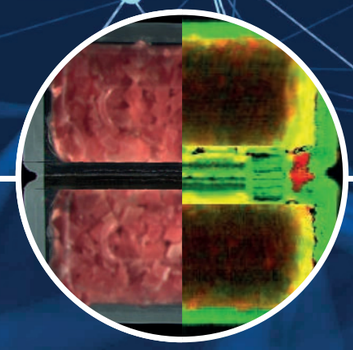


Our equipment can incorporate **INSPECTRA CHP® hyperspectral - monospectral vision technology** for advanced inspections. NIR/SWIR vision, above the visible range in the electromagnetic spectrum, can **detect defects that are indistinguishable to the naked eye**, and is also capable of i**nspecting through some packaging films with opaque inks**.
Hyperspectral inspection processing requires high processing power, which our electronic architectures handle efficiently and in very short times.
This technology makes it possible to detect **complex weld defects** (molten grease, interleaver, sera, etc.) or foreign body contamination in opaque packaging.

Artificial intelligence

Our equipment can optionally incorporate **artificial intelligence technology INSPECTRA Easy AI®** by Deep Learning for advanced inspections. By means of a previous training phase, the processing system is capable of automatically learning the type of defects contemplated, offering great power and inspection performance. This technology allows the reading of deformed text on labels, the detection of wrinkles in sealing film, faults in the arrangement of the product in the tray and the detection of foreign bodies that cannot be distinguished by colour.

Combination of technologies



INSPECTRA machines can **combine several vision technologies simultaneously**, when required. This allows to increase the throughput and inspection functionalities according to the type of container and defects of the specific product to be inspected. Our extensive experience in package inspection allows us to select the best combination of technologies for your specific application. Furthermore, the equipment is **scalable and expandable**, and by means of special adaptations can be readapted to new inspection requirements.

Services

Laboratory testing and consultancy

We offer the possibility of carrying out **image capture and processing tests** with product samples in our laboratory. Our facilities are fully equipped with the most advanced technologies in artificial vision and highly qualified technical staff.

Training

After the installation of an **INSPECTRA** equipment, we provide the customer with training for its correct use and maintenance. We explain **how to operate and maintain your equipment optimally**, thus obtaining maximum performance.

Technical Service

INSPECTRA's technical service offers the best performance in terms of qualification and response times. Throughout the lifetime of your equipment, you can rely on fast delivery of spare parts and other consumables.
We work with **market-leading suppliers**, integrating the highest quality components of the highest quality. We offer different types of maintenance contracts, adapted to the needs of your production processes.

Software Update

At **INSPECTRA** we ensure that we always have the most advanced and optimised software for our inspection equipment.
Our equipment is **remotely connected** to facilitate the supervision of their their operation in production and to speed up technical support tasks if necessary. if necessary. This functionality also allows for **software updates** in a faster and more flexible way.

INSPECTRA
MACHINE VISION EQUIPMENT

Our equipment

Post-packaging

Product inspection equipment in the post-packaging phase.

- **THERMOSEAL-LABEL INSPECTOR:** For the inspection of packaging.

Rejectors

Rejection systems for different product types and production processes.

Clasification

Equipment for automatic product sorting.

- **AI-SORTER:** For the sorting of products in a box.
- **CARCASS CHECKER** For the inspection and classification of carcasses

Pre-packaging

Product inspection equipment at the pre-packing phase.

- **SLICE INSPECTOR:** For the inspection of sliced product.
- **BULK INSPECTOR:** For the inspection of fresh product.

Vision Solutions

Tailor-made developments of artificial vision.

Tailor-made equipment

Adaptation of equipment to clients.

Software Solutions

Our software applications for INSPECTRA equipment.

- **INSPECTRA SCHEDULER SYSTEM:** Interface and Control Software.
- **INSPECTRA PRODUCTION BROWSER:** Visualization and Analysis Application.
- **INSPECTRA LABEL CHECKER:** Label Checker Software.
- **INSPECTRA PRODUCTION SERVER:** Real-time monitorig software.

Post-packaging

THERMOSEAL-LABEL INSPECTOR

Packaging inspection

Manual interface

- 17" touch screen
- Control keypad
- Rejection activation key

Rejection module

- Filling sensor
- Access key

Image capture system

- Up to 3 RGB/monochrome inspection cameras
- High power LED lighting system
- Automatic height adjustment system

Packaging centring system

- Adjustable to the size of the package to be inspected

Conveyor system

- Up to 2 sections and 2 inspection shafts
- Independent geared motors
- Easy belt removal

Características

Its function is to inspect for quality deviations of the packaging and the product. It performs a seal check, inspects the top and bottom of the pack, and can check that the top and bottom labelling is correct.

The equipment has the following inspection functionalities:

- **Inspection of the sealing:**
  - Verification of the integrity of the sealing area.
  - Product entrapment, even those not detectable visually (e.g.: melted grease).
  - Detection of wrinkles in the film.

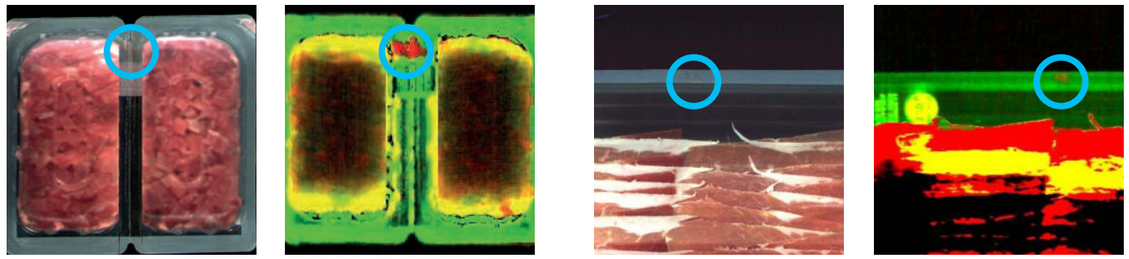
- **Inspection of packaged product:**
  - Detection of foreign bodies and product distribution anomalies in the packaging.

- **Inspection of labelling:**
  - Includes INSPECTRA LABEL CHECKER software module (optional).
  - Presence, location and correct orientation of labels.
  - Label verification and pattern checking.

- **Digitisation of production:**
  - Includes INSPECTRA PRODUCTION BROWSER software module (optional).

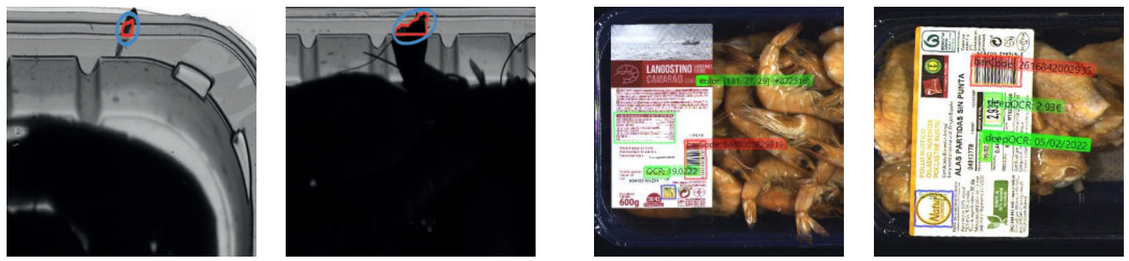
The OK/KO product classification criteria are based on configurable parameters from the software. Suitable for the vast majority of heat-sealed packs, flowpacks, vertical pouches, etc.

INSPECTRA
MACHINE VISION EQUIPMENT



Product trapping in two-pack packaging of ham cubes

Fat trapping in ham packaging



Product trapping in heat-sealed packaging

Inspection of labels on packaging

RGB

Hyperspectral vision

Deep Learning

Remote control

Welding inspection

Contamination detection

Qualitative analysis

Label verification

Production viewer

Options

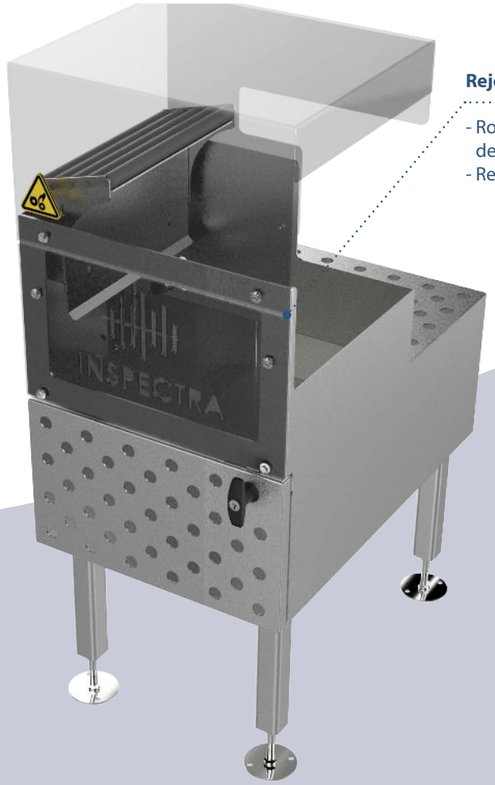
- RGB/hyperspectral NIR-SWIR vision technology.
- Product inspection and labelling inspection.
- Split option (possibility of separate cabinet).
- Flap or blow-off rejection systems, with storage drawer.

Applications

Thermoseal Inspector Model	Remote control	Image viewer	RGB vision	CCI Vision	Inspection of labelling	Inspection of product	Deep Learning	Split	Rejection system
Standard	YES	YES	YES	NO	OPTIONAL	OPTIONAL	OPTIONAL	NO	OPTIONAL
Advanced	YES	YES	YES	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL

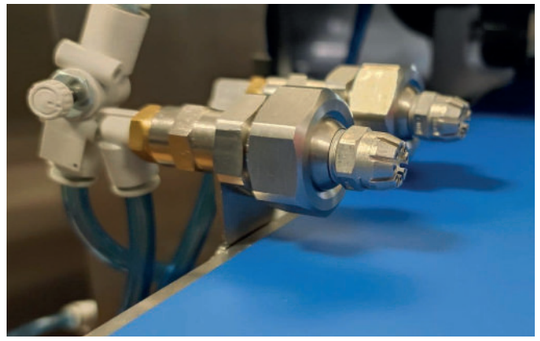
REJECTORS

On-line rejection and sorting systems

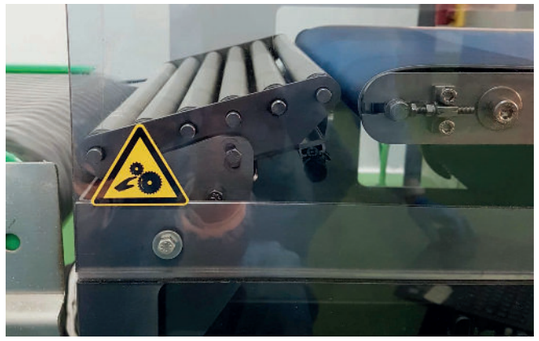


Rejection module by trapdoor

- Roller ramp with pneumatic or blowing depending on model
- Removable box for product removal



Double blowing nozzle with regulation



Rejection module by trapdoor

Rejection signal for external robot on production line

Features

In-line rejection and sorting systems are designed to remove defective packaging from the production process, adapting to the production capacity of each customer depending on the type of product and packaging.

Our rejection systems offer high performance due to their fast response times and efficiency. The storage modules have a double level of filling alert, and allow locking with a key to restrict access to rejected containers.

Connection to INSPECTRA inspection equipment is simple via quick connectors.
The pneumatic system has an under-pressure warning system to ensure that the rejection system always operates under optimum conditions.

In order to choose the most suitable rejection system, INSPECTRA's technical service will advise you with the best solution adapted to the needs of your production process.

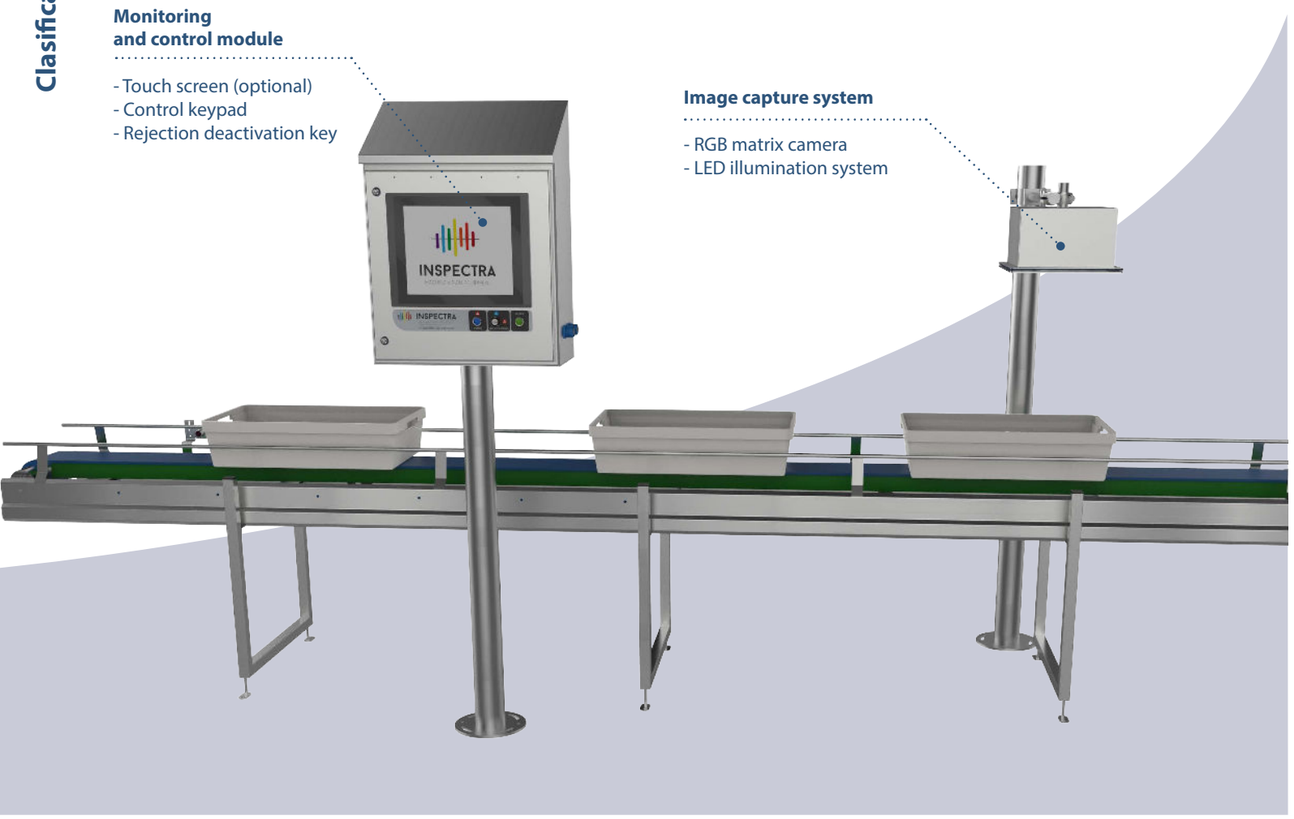
Options

- **Rejection by blowing nozzles:** with different models and configurations depending on the type of packaging and process.
- **Rejection by trapdoor:** with vertical displacement and fast response times, recommended for flat packages.
- **Rejection by diversion:** with rejection mechanism through flipper-type blades.
- **Rejection signal:** INSPECTRA equipment can communicate with other external rejection systems on production lines.
- **Storage box**: for the collection and control of rejected packaging.

Rejector models	Storage box	KOS key	Fill sensor
Trapdoor	OPTIONAL	OPTIONAL	YES
Blowing nozzles	OPTIONAL	OPTIONAL	OPTIONAL
Rejection blades	OPTIONAL	OPTIONAL	OPTIONAL

AI-SORTER

Boxed product classification



Features

Its objective is to identify the type of product contained in the box during the production process.

The equipment has the following functionalities:

- **Automatic product classification:s:**
  - Image processing using Deep Learning technology.
  - Segmentation between families and by-products.
  - Product identification by means of labels.
  - Automation of subsequent operations on the line.

- **Inspection of the boxed product:**
  - Detection of product distribution anomalies in the box.

- **Digitalization of production:**
  - Includes the INSPECTRA PRODUCTION BROWSER software module (optional).

Cutting line operators

Automatic sorting of boxes of quartered products

RGB | Deep Learning | Remote control | Production viewer

Options

- Transport and rejection system.

Applications

AI-Sorter models	Remote control	Image viewer	RGB vision	Deep Learning	Rejection system
Standard	YES	YES	YES	YES	OPTIONAL

AI-Sorter

CARCASS CHECKER

Carcass inspection and classification

Features

Its objective is to identify quality defects in carcass dressing and to classify the sex of the animal.

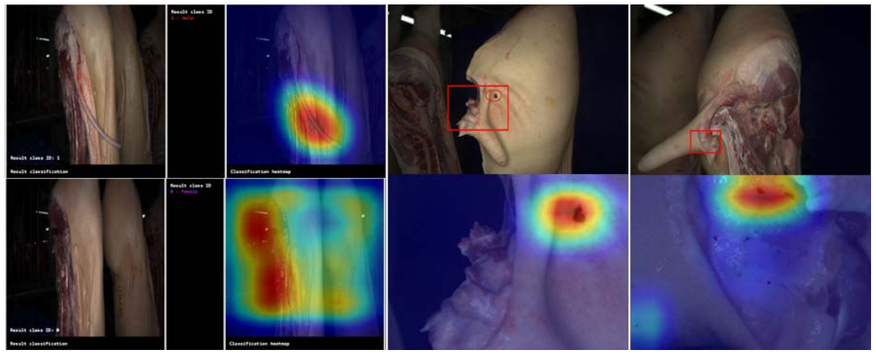
The equipment has the following functionalities:

• **Automatic carcass classification:**
- Image processing using Deep Learning technology.
- Segmentation by sex and defect.
- Traceability of the product by RFID tag of the litter.
- Automation of inspection operations.

• **Automation of rejection:**
- Sending of signal for reprocessing loop or diversion to another line.

• **Digitalisation of production:**
- Includes the INSPECTRA PRODUCTION BROWSER software module (optional).

Factory installation



Sex and faecal contamination detection

RGB | Deep Learning | Remote control | Production viewer | Detection of contamination

Options

• Number of cameras according to inspections.

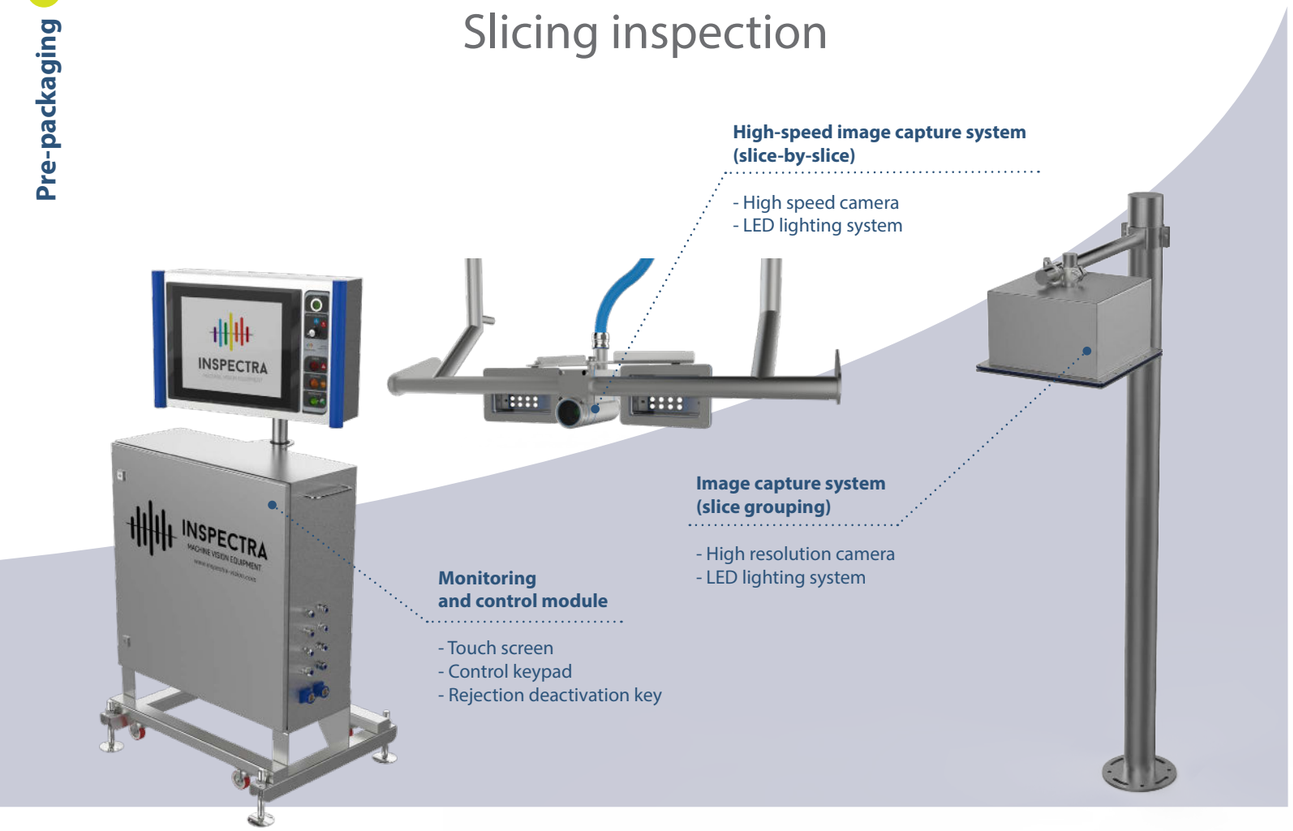
Applications

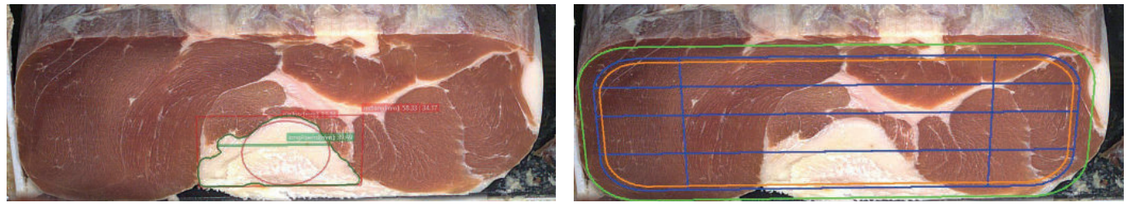
Carcass Checker models	Remote control	Image viewer	RGB vision	Deep Learning	Rejection system
Standard	YES	YES	YES	YES	SIGNAL

Carcass Checker

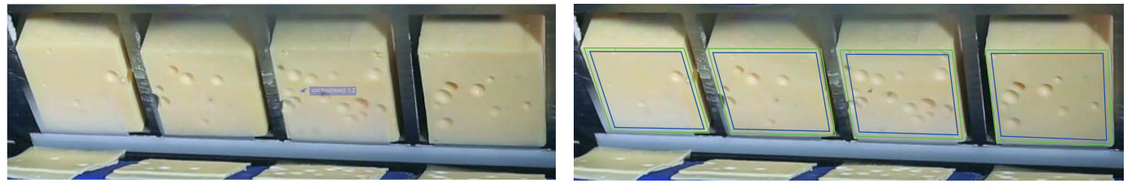
SLICE INSPECTOR

Slicing inspection





Defect of excess fat in slice of cured ham



Defect of plastic contamination in cheese

RGB · Deep Learning · High-speed vision · Remote control

Contamination detection · Qualitative analysis · Production viewer

Features

Its objective is to ensure the quality of the sliced product. This control can be carried out both by inspecting each slice during the slicing process and after slicing by controlling the quality of the grouping of all the slices produced.

The equipment has the following functionalities:

- **Inspection and classification of product quality:**
  - Presence of contamination in each slice (e.g. plastics, oxidation, mould).
  - Distribution and proportion of components or additives in each slice (e.g.: fat in ham/sausages, eyes in cheese, olives in mortadella).
  - Detection of anomalies in each sliced grouping (e.g. broken slices).

- **Digitalisation of production:**
  - Includes the INSPECTRA PRODUCTION BROWSER software module (optional).

The OK/KO product classification criteria are based on easily configurable parameters from the software. Possibility of communication and reception of configurations from the customer's ERP.

Options

- Slice-by-slice inspection
- Slice grouping inspection

Applications

Thermoseal Inspector models	Remote control	Image viewer	Slice-by-slice inspection	Slice grouping inspection	Deep Learning
Standard	YES	YES	NO	YES	OPTIONAL
Advanced	YES	YES	OPTIONAL	OPTIONAL	OPTIONAL

Slice Inspector

Pre-packaging

BULK INSPECTOR

Inspección de producto fresco

Image capture system

- NIR/SWIR Hyperspectral Camera
- RGB linear camera

Lighting system

- Hyperspectral illumination
- LED System

Monitoring and control module

- Touch screen
- Control keypad
- Rejection deactivation key

Wheels with locking system

- Scrolling wheels
- Easy removal for cleaning

Features

Its objective is to ensure the quality of the fresh product, in bulk or in bunches, by means of an in-line inspection before packaging.

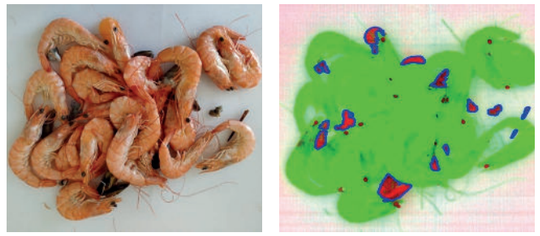
The equipment has the following functionalities:

- **Contamination inspection:**
  - Detection of surface foreign bodies, even those with the same colour shade as the product (e.g. plastic, wood, cardboard).
  - Presence of product processing and dressing faults (e.g. tendons, bones, shells).

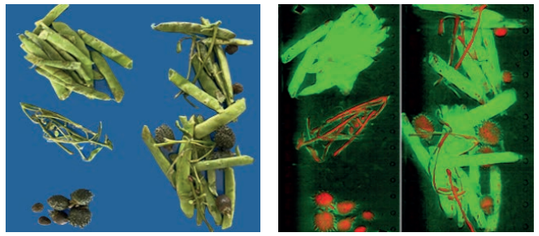
- **Inspection of product quality:**
  - Evaluation and classification of qualitative parameters (e.g. appearance, proportion of components, differences detectable by NIR/SWIR vision).

- **Digitisation of production:**
  - Including the INSPECTRA PRODUCTION BROWSER software module (optional).

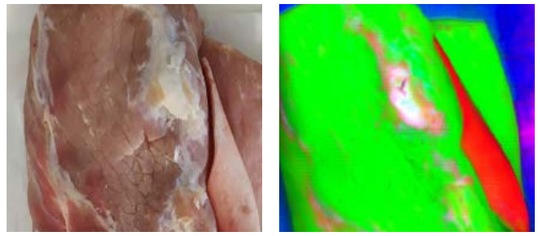
OK/KO product classification criteria are based on configurable parameters from the software. The equipment can analyse the quality of a wide variety of fresh products, and it is possible to inspecion programmes depending on the type of product in production.



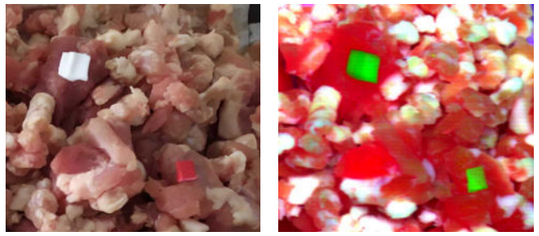
Detection of foreign bodies in cooked shrimp



Detection of foreign bodies in green beans



Bone detection in cutting process



Detection of foreign bodies and lean-fat ratio in minced meat

RGB | Hyperspectral vision | Deep Learning | Remote control

Contamination detection | Qualitative analysis | Production viewer

Options

- NIR-SWIR RGB/hyperspectral vision technology.
- Artificial Intelligence Technology by Deep Learning.
- Conveyor and rejection system

Bulk Inspector models	Remote control	Image viewer	RGB vision	CCI vision	Deep Learning	Conveyor and rejection system
Standard	YES	YES	YES	NO	OPTIONAL	OPTIONAL
Advanced	YES	YES	OPTIONAL	YES	OPTIONAL	OPTIONAL

All the possibilities

Different options for each equipment

Post-packaging

THERMOSEAL-LABEL INSPECTOR

Packaging inspection

Thermoseal Inspector models	Remote control	Image viewer	RGB vision	CCI vision	Labelling inspection	Product inspection	Deep Learning	Split	Rejection systems
Standard	YES	YES	YES	NO	OPTIONAL	OPTIONAL	OPTIONAL	NO	OPTIONAL
Advanced	YES	YES	YES	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL

Rejectors

REJECTORS

On-line rejection and sorting systems

Rejector models	Cajón de llenado	Llave de KOS	Sensor de llenado
Trampilla	OPTIONAL	OPTIONAL	YES
Blowing nozzles	OPTIONAL	OPTIONAL	OPTIONAL
Palas de desvío	OPTIONAL	OPTIONAL	OPTIONAL

Classification

AI-SORTER

Boxed product classification

AI-Sorter Models	Remote control	Image viewer	RGB vision	Deep Learning	Rejection system
Standard	YES	YES	YES	YES	OPTIONAL

CARCASS CHECKER

Carcass inspection and classification

Carcass Checker models	Remote control	Image viewer	RGB vision	Deep Learning	Rejection system
Standard	YES	YES	YES	YES	SIGNAL

Pre-packaging

SLICE INSPECTOR

Slicing inspection

Slice Inspector models	Remote control	Image viewer	Slice-by-slice inspection	Slice grouping inspection	Deep Learning
Standard	YES	YES	NO	YES	OPTIONAL
Advanced	YES	YES	OPTIONAL	OPTIONAL	OPTIONAL

BULK INSPECTOR

Fresh product inspection

Bulk Inspector models	Remote control	Image viewer	RGB vision	CCI vision	Deep Learning	Conveyor and rejection system
Standard	YES	YES	YES	NO	OPTIONAL	OPTIONAL
Advanced	YES	YES	OPTIONAL	YES	OPTIONAL	OPTIONAL

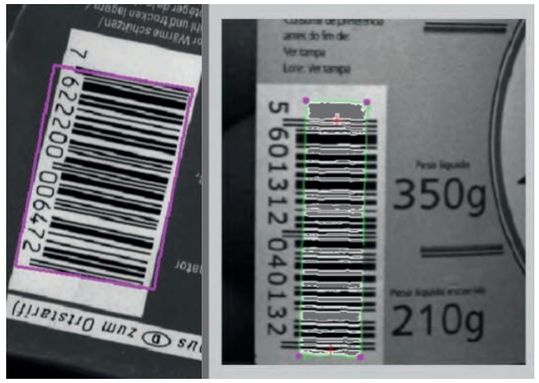
VISION SOLUTIONS

Applications and vision projects

Advanced inspection of printed labels and codes

For advanced inspection of printed labels and codes, we integrate various reading technologies including OCR, Deep OCR and OCV.

- Barcodes
- QR codes
- Datamatrix codes
- PDF417 codes
- Verification of alphanumeric characters (presence and legibility)



Automatic verification of correct printing of barcode

Deep OCR character recognition

Integration with customer production systems

We integrate advanced printed code reading technology with customer production systems, such as ERP (Enterprise Resource Planning) and MES (Manufacturing Execution System), to improve efficiency and accuracy in supply chain management and product production.

Our integration with these systems allows for greater automation and synchronisation of the information of the information of the entire production process

INSPECTRA Compact Vision Solutions

We have **compact vision solutions for basic applications that require less processing power than inspection equipment**, and which, **due to their reduced size, can be installed in areas with limited space.** These solutions are customised for each specific application, with a high degree of adaptation to both the product and the lines of each customer.

- Compact machine vision systems easily expandable and adaptable to customer lines
- IP69 food-grade hygienic stainless steel design
- Communication with customer's production systems
- Connection to external signalling and warning systems: beacons, indicator lights, sirens, etc.
- Remote connection to the equipment from any PC
- Automatic sending of alarms (e-mail) after detection of defects, foreign bodies or preset inspection indicators
- Visualisation and recording of images with detected defects and traceability

Detection of presence/absence of labels and printed codes

Detection of foreign bodies in dough mixers and mincers

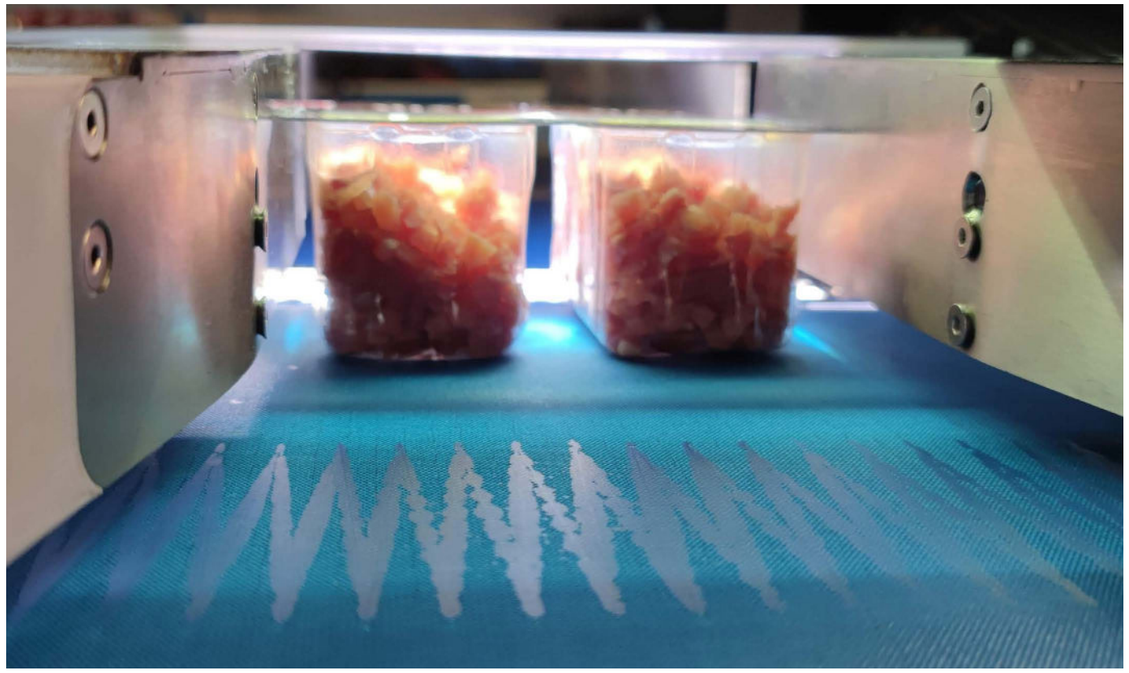
Basic product anomaly detection and product presence/absence or unit count detection

TAILOR-MADE EQUIPMENT

Adaptation of equipment to customers

Each customer has specific quality requirements and production characteristics. Therefore, we adapt our equipment to the needs of our customers and the requirements of their production processes.

We adapt the design to the customer's production line, making it compatible with the various elements in the installation. We adapt the vision systems for each packaging and product, selecting the most suitable technologies.



Tailor-made equipment

At INSPECTRA we select the best vision technology for each project and carry out initial feasibility tests in our laboratory with the customer's products.

Our equipment is integrated into production management systems (batch coding, products, etc.) and reports in real time the productivity and quality indicators of the production line.

In addition, INSPECTRA equipment allows the improvement of production processes as it inspects 100% of the food, digitising quality and production data, displaying indicators in real time.

Design adapted to production lines

We carry out the design adapted to the customer's process line, being able to interact with different elements of the existing installation (rejection systems, production control, batch identification, etc.).

INSPECTRA equipment can be easily integrated into production lines. Our technical department coordinates with the client the adaptation and possible modifications of the design according to the needs, both for the inspection equipment and for the rejection and transport systems.

Specific software design

Development of specific image processing software, with associated control logic and user interface. We develop customised applications for each product, analysing with our clients the most suitable tools and technologies in each case.

Possibility of adapting the user interface to the specific needs of the client. To this end, our design department works in coordination with the client's technical departments, who are the ones who best understand the needs of the end user.

INSPECTRA SCHEDULER SYSTEM

Interface and control Software

Slice Inspector ISS

Thermoseal Inspector ISS

Features

The ISS is the operating software for all INSPECTRA devices.
It has different functionalities that are visualised in the corresponding sections of the programme:

CONTROL PANEL

The Control Panel allows you to visualise the operation of the equipment, showing productivity and quality indicators for the batch in progress.
It displays the images captured by the different cameras and those processed, showing the reason for the rejection, as well as statistics on the number of rejections for each defect inspected.

HISTORY

The History allows you to view all the production batches stored in the machine, with a summary of their inspection parameters and results. The programmes are sorted in the history in ascending order, from the oldest to the newest, and allows quick retrieval of productivity data.

PROGRAMMES

The software allows the different quality inspection programmes to be configured for each type of product. On the one hand, the quality requirements of the product are established for it to be accepted or rejected, and on the other hand, production and quality reference indicators are established to determine alarm situations.

CONFIGURATION

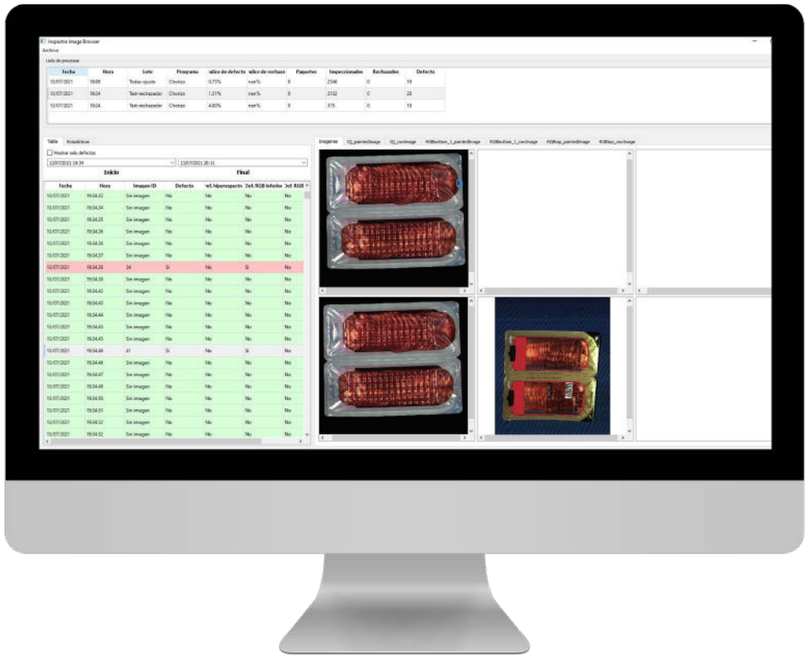
In the Configuration section, all the operating settings of the equipment are established, facilitating the diagnosis of the different components during installation and maintenance actions, also storing operating data. Access is password-protected, with only maintenance personnel having access.

Inspectra Scheduler System

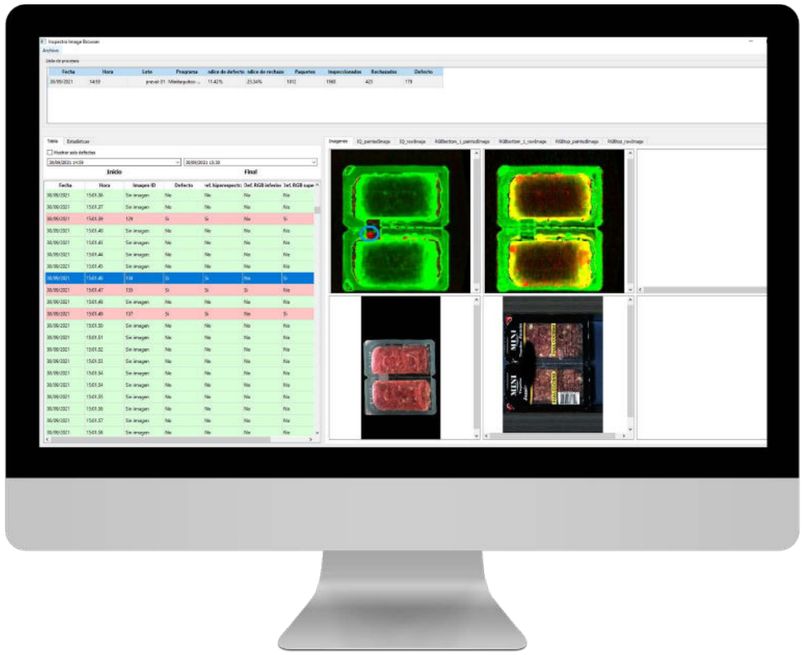
Software solutions

INSPECTRA PRODUCTION BROWSER

Visualization and analysis application



Example of application with bipack sausage packaging



Example of application with two-pack packaging for ham taquitos

Features

Inspectra Production Browser is a standalone application that allows remote consultation of the data captured by INSPECTRA equipment.

The software allows the consultation of production and quality data history by manufacturing batches, generating indicators in real time.

Database and generation of performance graphs for production analysis, quality, upstream process optimisation and supplier evaluation.

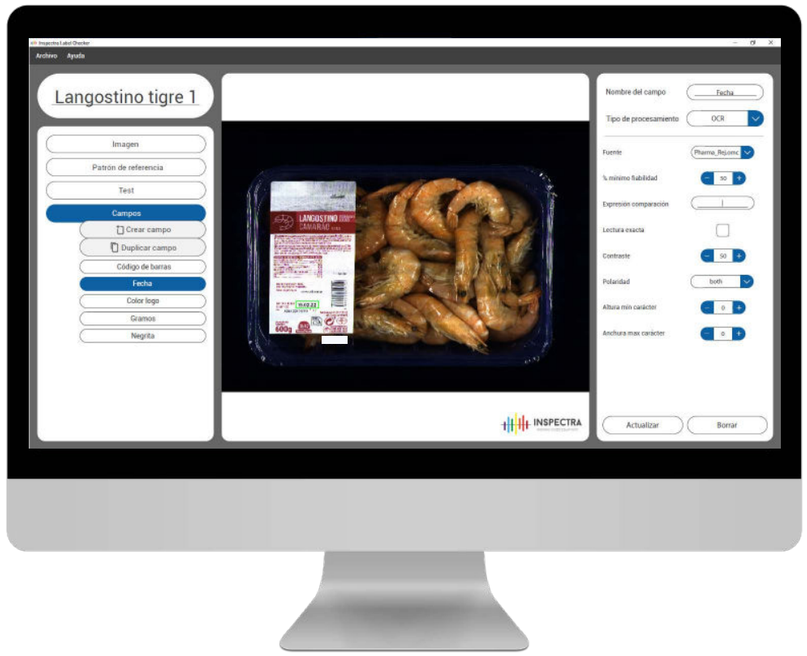
Generation of an image file of the inspected products with quality faults. Possibility of applying different filters by date or type of defect, to facilitate and simplify searches.

Communication and reception of configurations from the customer's ERP, allowing a perfect integration in the production lines.

Inspectra Production Browser

INSPECTRA LABEL CHECKER

Label checking Software



Label inspection programme configuration process

Examples of reading labels and codes using inspection software

Features

Inspectra Label Checker is the software for c**onfiguring label inspection programs** for Label Inspector or Thermoseal Inspector equipment.

The software allows **flexibility in the configuration of label inspection** criteria. It allows new labels to be conveniently created from the PC and then uploaded to the machine via remote connection. It also allows the a**utomatic loading of inspection**.

Another of its advantages is that the inspection **results can be stored** so that they can be consulted and compared with those of the **customer's ERP or the labeller** for verification.

The software has an **ergonomic, simple and intuitive interface** that allows the creation of a label inspection program in **ultra-fast times** (less than 1 min. for basic configurations). And it allows the testing of new programs before putting them into production.

It can check a wide range of defects on the label or film, such as: complex text recognition, double labelling, position verification, advanced verification of barcodes and QR codes, absence of marks or stickers, detection of smudges, etc.

The software integrates **artificial intelligence character recognition technologies** that allow the reading of texts with crossed-out or joined characters, which are impossible to detect using conventional OCR techniques.

Inspectra Label Checker

Software solutions

INSPECTRA PRODUCTION SERVER

Real-time monitoring software

IoT platform for real-time monitoring of the different INSPECTRA equipment

Example of a dashboard displaying different operating parameters

Features

Inspectra Production Server is the software that allows real-time monitoring of the operation of a set of INSPECTRA inspection equipment installed in the same customer, even in different geographical locations.

Operation is monitored from a single platform, facilitating **remote monitoring of all equipment** using the **MQTT connectivity** built into the ISS.

It allows you to consult the results of the inspection of each equipment in real time, showing **productivity indicators and quality rejection rate** in real time.

It shows **graphs of production performance and production quality**, and can analyse the evolution of production processes and quality indicators.

It allows a global view of any **equipment operating incident** (rejection deactivation, emergency stops, change of inspection programmes, breakdowns, etc.).

It allows to make a **copy of the images captured** by each equipment (100% production or only the failures), and to have a **record of the production** to deal with possible claims.

Inspectra Production Server

WE GENERATE VALUE

The best returns on your investment

Reduction of personnel costs

Our equipment automates manual inspection tasks, reducing personnel costs (selection, recruitment, training, management, rotation).

Reduction of claims costs

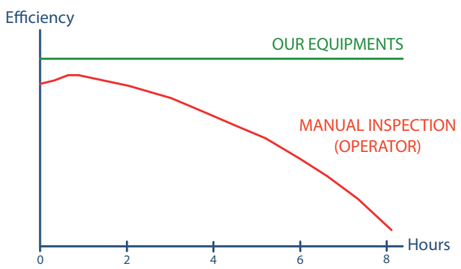
We reduce your customers' claims: financial penalties, destruction of consignments, product returns, etc.

Increased reliability in your quality inspection

• Our inspection is objective, parameterizable and constant.
• We detect quality defects that are not possible to detect in a manual inspection: by size, by speed and by transparency.
• The best inspection performance on the market, with patented INSPECTRA® technology.

Inspection yields > 99%*

(*) Average data obtained with more than 100 million containers inspected. Average false negative yields provided by customers of in-line equipment with production processes focused on nominal conditions.



Comparative graph of performance in one shift

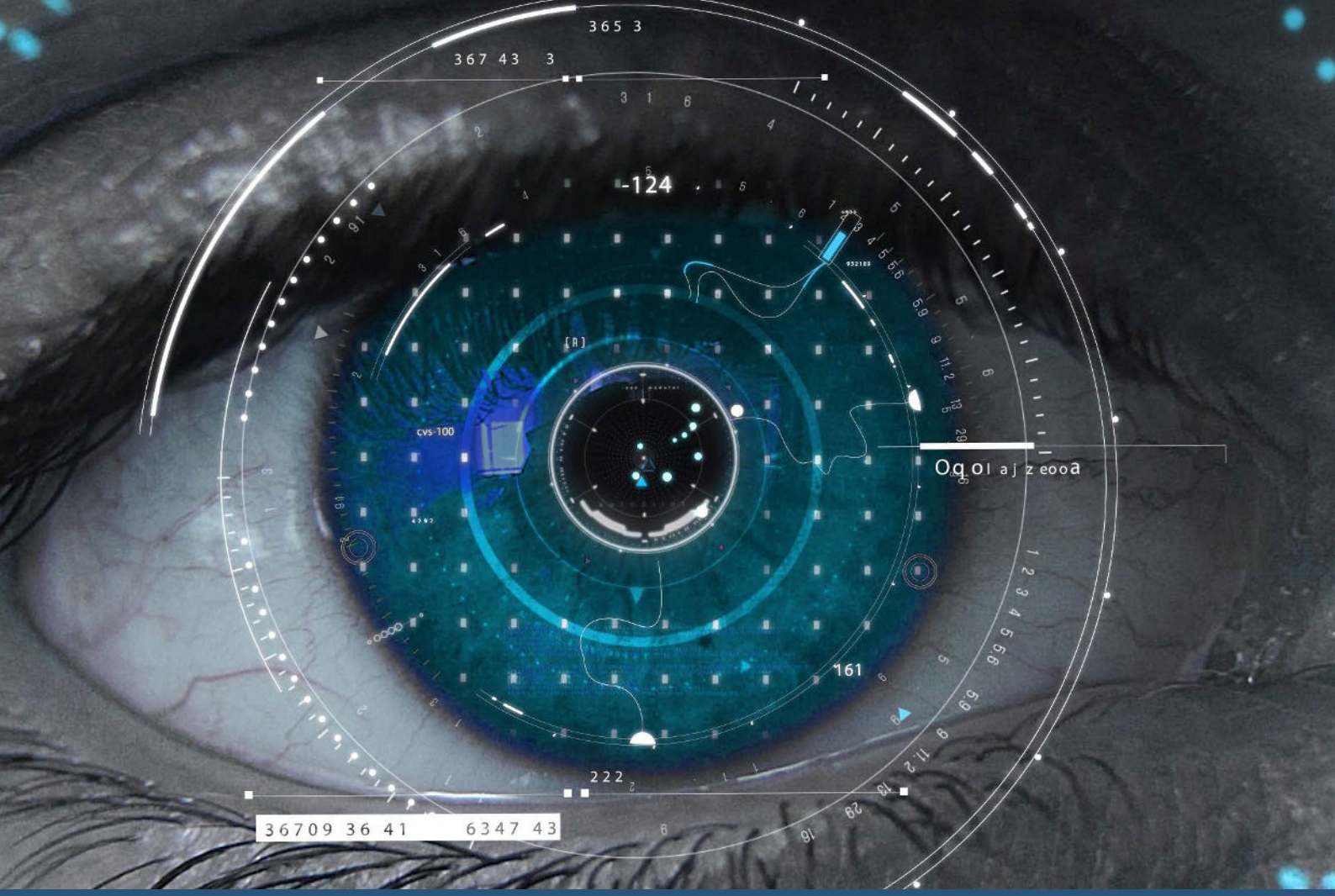
We contribute to the improvement of your OEE

• We digitize 100% of your production offering you data for a continuous improvement of your processes and your suppliers.
• Traceability and registration of all defects in both packaging and fresh product.
• Real time alarms in case of quality deviations in the line.
• The high inspection speed of the equipment makes it possible to increase the production speed of your lines.

We take care of your brand image with the most demanding customers

• Reducing the quality incidents of its products in the consumer, and preserving its brand image.
• Demonstrating to your customers your commitment to quality by incorporating the most advanced inspection technologies in the market to your production process.

- The biggest producers in the market rely on our equipment. -



Equipment subject to modifications. The final technical specifications of each equipment shall be specified in its corresponding technical documentation.

1.4 Version

INSPECTRA

MACHINE VISION EQUIPMENT

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