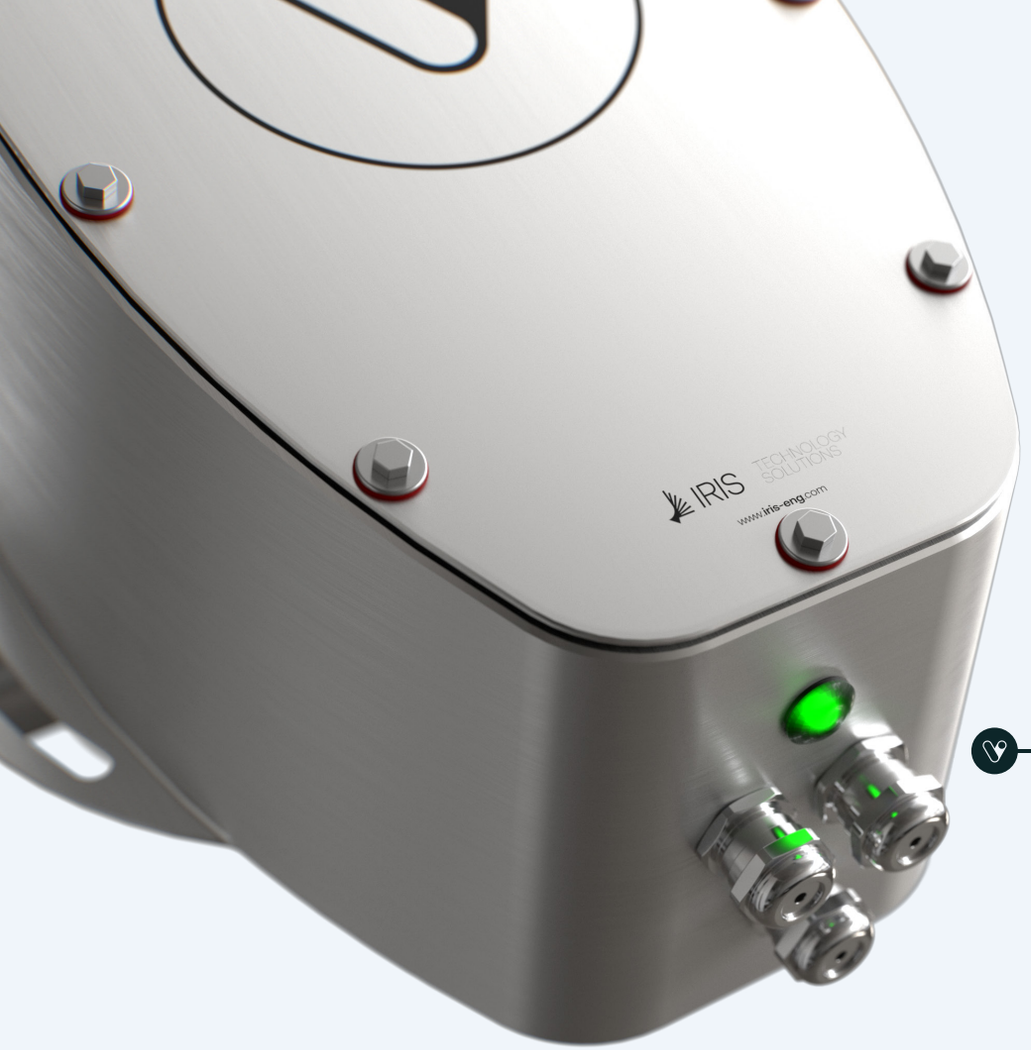
VISUM SOLUTIONS

Process & Quality Control Systems

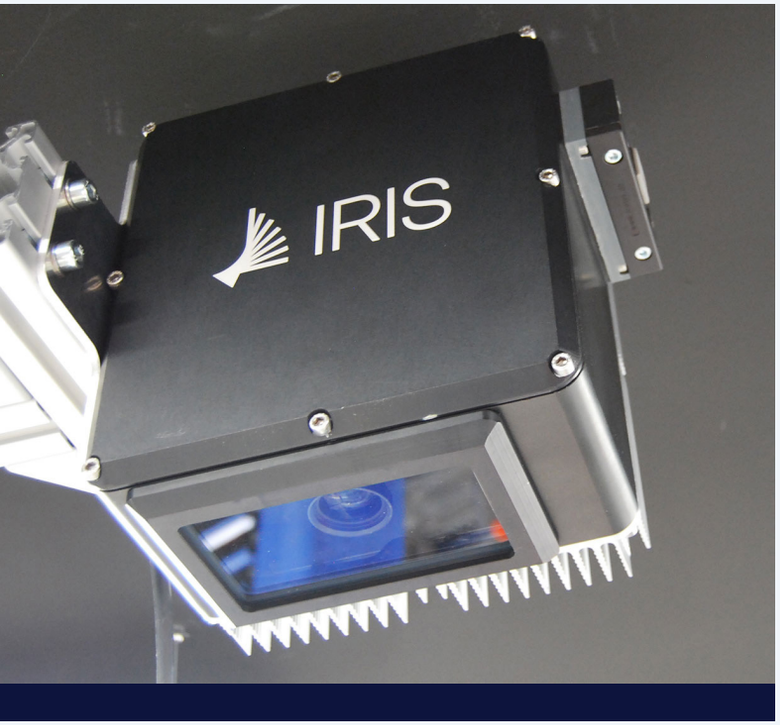
IRIS TECHNOLOGY SOLUTIONS



IRIS TECHNOLOGY SOLUTIONS

Quality and **Process Control Solutions** for **Industry**

Under the **Visum®** brand, **we manufacture end-to-end solutions** to **improve quality and control production processes** in a wide **variety of industries**. Our **systems** based on **NIR spectroscopy**, **Hyperspectral imaging**, **Raman spectroscopy** and **Machine Vision** provide **real-time information** and **results**. **Visum®** brings the **laboratory to the production line**.



In-line Spectroscopy

We **employ NIRS** technology (Near-Infrared Spectroscopy) **technology, Hyperspectral Imaging** (HSI) and **Raman spectroscopy in real time**, among other **photonic techniques** such as **UV** and **fluorescence** with **artificial intelligence artificial intelligence tools** and **software for the development of solutions** for the analysis and classification of foodstuffs, grains, plastics, organic and inorganic waste organic and inorganic waste, wood panels pharmaceutical products, chemicals, cosmetics, among a wide variety of materials and mixtures.

Machine Vision & Deep Learning

We use **our knowledge** in **optics**, **software** and **engineering** to develop **machine vision systems** and **neural networks** -or deep learning- to distinguish and classify anomalies, characters and natural variations in **complex patterns**. Our **machine vision systems** are used for the control and analysis of defects in grains, nuts, fish, labeling, packaging, among the most popular technology applications.

Benefits

- Real-time monitoring of physical and chemical parameters.
- Industrial use and does not require specialized personnel.
- Possibility of analyzing multiple parameters simultaneously.
- Time savings in laboratory analysis, inputs or visual inspection.
- Real time information to rectify processes and optimize decision making.
- Detection of superficial foreign bodies.
- Reduction of losses, claims and/or returns.

Sectors

Food

- Bakery & Oils
- Fruits, vegetables and derivatives
- Dairy
- Fish & Seafood
- Meat
- Baby Food

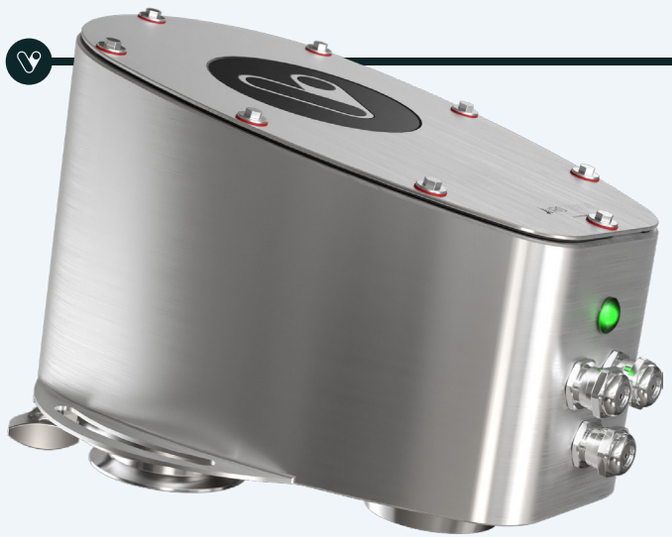
Pharma

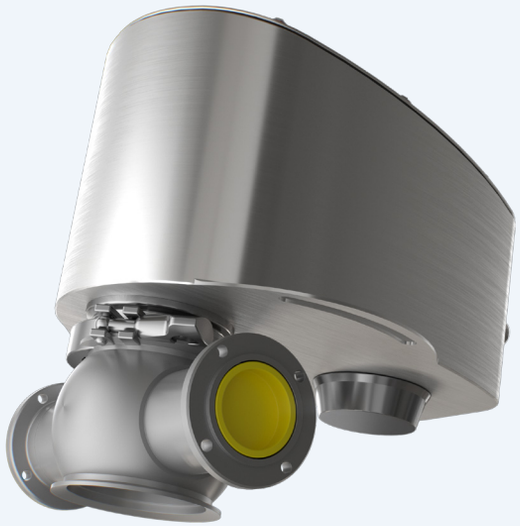
- Pharmaceutical
- Chemical
- Cosmetics

Other Industries

- Wood
- Plastics
- Waste
- Biofuels
- Other industries

Visum NIR In-Line™





In-line, real-time NIR analyser: accurate, continuous measurements for process optimisation and quality control in the plant.

The Visum NIR In-Line™ analyser adapts to different working geometries, it is suitable for monitoring **conveyor belts**, **pipes**, **blenders** or even **machinery** through a dedicated optical probe. It is stand-alone and does not require an external computer, communicating directly with the line PLC and plant information system.

Main Functionalities

- Continuous monitoring of critical product quality attributes: solids, semisolids and liquids.
- Integration and communication with process machinery and information systems.
- End point determination of unit processes.

Sectors

FOOD

- Food analysis: juices, smoothies, purees, dairy products, oils, sweets, olives, nuts, bakery products, chocolates, baby food, blends, food supplements, among other foods and beverages.
- Rapid verification of the raw material.
- End point of the drying process (residual moisture).
- End point of mixing process (homogeneity).
- Typical particle size.

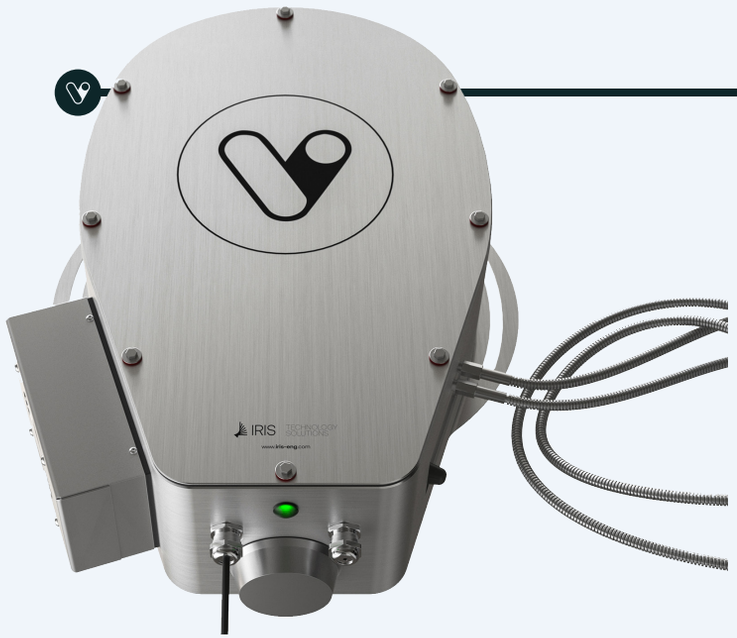
PHARMA

- Content uniformity analysis (% of APIs and excipients).
- Automatic control of the mixing process (no calibration required).

OTHER INDUSTRIES

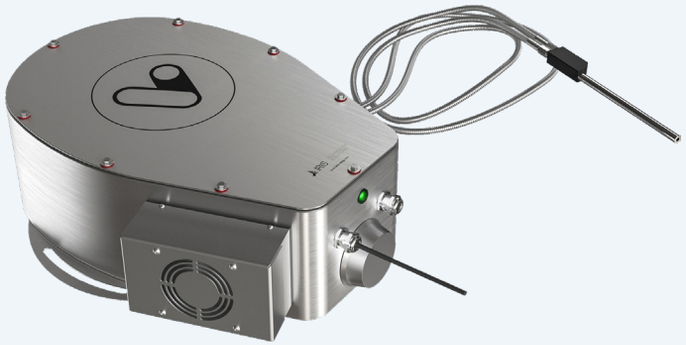
- Identification of polymers and composites.
- Classification of plastics.
- Determination of water content and moisture
- Determination of biofuel quality parameters.

Visum Raman In-Line™



Industrial analyser based on Raman spectroscopy for in-line, real-time process control.

The Visum Raman In-Line™ analyser is a powerful analytical tool that provides quantitative and qualitative information on a wide variety of substances and mixtures in just seconds, especially suitable for aqueous media (water abundance), in the absence of fluorescence.



Main Functionalities

- All-in-one analyser (no external computer required).
- Customised probes.
- Connection to the PLC of the line.
- No qualified personnel is required for its use.
- Allows the chemical composition of liquids, powders and solids to be analysed.
- Turnkey supply.

Sectors

PHARMA

- Quantification of APIs and excipients in real-time.
- Quantitative analysis of formulations.
- Process monitoring and characterization in bioreactors.
- Contamination detection.
- Crystallization process monitoring.
- Core and coated tablet content prediction.

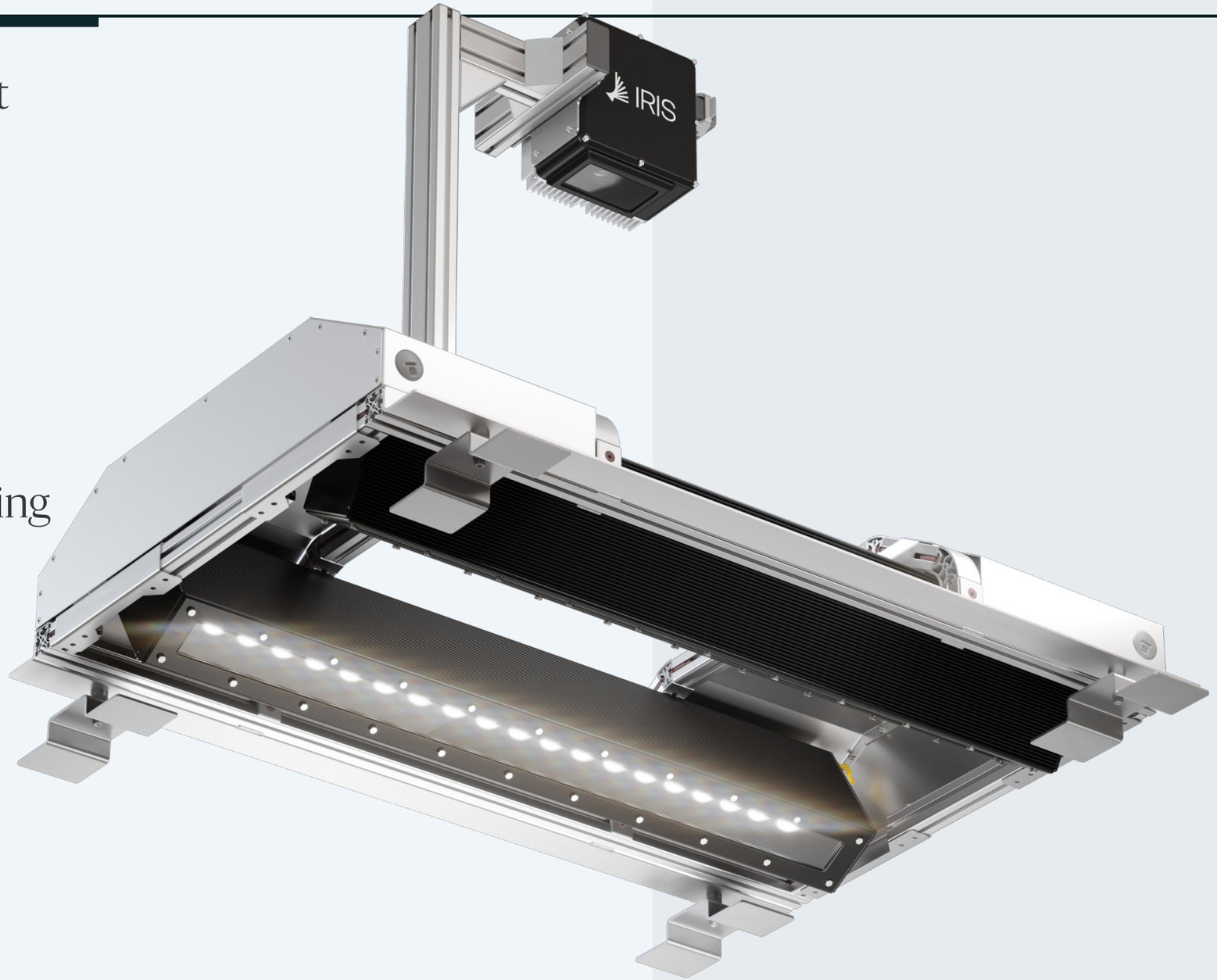
OTHER INDUSTRIES

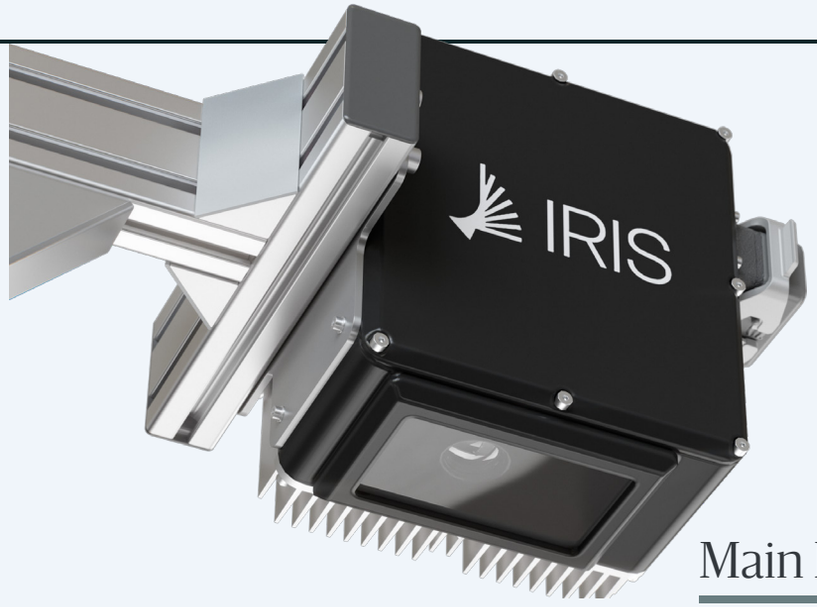
- Polymerization process control
- Quantitative analysis of formulations..

Visum Raman In-Line™ is a Process Analytical Technology (PAT) tool for the pharmaceutical, chemical and bioprocess industries that enables the inspection of various industrial processes safely, accurately and in real time using a dedicated optical probe.

Visum HSI™

Visum HSI™ is the most robust and versatile Hyperspectral Imaging System (HSI) on the market. It is designed to be integrated into any production line and provides pixel-by-pixel physical chemical information of everything that passes over the conveyor belt.





Main Functionalities

- Detection of superficial foreign bodies in the production line (paper, cardboard, rubber, plastics, metals, among others).
- Quantitative and qualitative analysis with spatial distribution of each product unit passing over the conveyor belt.
- Control of homogeneity, distribution and quantity of ingredients desired in each product unit.
- Versatile technology: NIR or Vis-NIR.
- IRIS Technology's hyperspectral imaging systems adapt to the required belt width and speed without limitations.
- Integrated with all types of PLC, rejection system and SCADA.
- Improvement of quality and safety.
- Brand image protection.

Sectors

FOOD

- Quantitative and qualitative analysis of each product unit (fats, fibers, proteins, moisture, among others or qualitative parameters such as shape, colour and texture), depending on the product.
- Detection of superficial foreign bodies for their rejection.
- Product homogenisation.
- Product or recipe optimization.

RECYCLING/CIRCULAR ECONOMY

- Characterization, quantification and classification of polymers.
- Sorting of plastics in recycling.
- Recovery of multilayer plastics.
- Monitoring and sorting of organic and inorganic waste.

WOOD

- Moisture monitoring of particleboards in the impregnation line.
- Curing factor classification of wood boards.
- Quantification of wood chips flow for process control.
- Quantification or classification of resins.
- Detection of foreign bodies.
- Adhesive homogeneity in laminated veneer.

Visum PALM™

Handeld NIR analyser for use in the field or at various points in the manufacturing process, from raw material to final quality control.

The Visum Palm™ analyser features an embedded computer and touch screen, plus a 10 mm measurement spot and higher spectral resolution for more chemical information and better accuracy and repeatability of each analysis.

Main Functionalities

- Robust and designed for industrial environments and field use.
- Excellent repeatability and measurement.
- Non-destructive determinations without sample preparation.
- No skilled operators required.
- Embedded computer and touch screen.
- Ethernet / Wi-Fi connection.

Sectors

FOOD

- Control of quality parameters in fruit, vegetables, minced meat, pastries and bakery products, snacks, olives and derivatives, oils, flours, powdered milk, grains, among other food products.
- Quick verification of raw material.
- Typical particle size.
- Detection of anomalies.

PHARMA

- Identification of APIs and excipients.
- Particle size determination.
- At-line control of formulation content uniformity.
- Control of the coating process of microgranulated forms.
- At-line determination of the end point of unit processes.
- Raw material identification and anomaly detection.

OTHER INDUSTRIES

- Polymer identification.
- Polymer characterization.
- Classification of plastics.
- Control of talc and adulteration.

Visum DeepSight™

Industrial machine vision system assisted by deep learning for colorimetric and morphological quality control and the detection of complex defects and indeterminate variations in different products.

Deep learning technology allows results to be obtained where machine vision alone is not capable and has several applications in industry.

Main Functionalities

- Detection of quality defects for sorting or rejection.
- Detection of surface foreign bodies.
- Classification and quantification of defects.
- Fast and economical integration to the production line.
- Communication with information systems.
- Antireflex system.
- Visum® software, computer system and touch screen.

Sectors

FOOD

- Control of defects:
  - Grains.
  - Nuts.
  - Other fruits.
  - Fish loins.
  - Other food.
- Detection of foreign bodies on the belt and in the product.

OTHER INDUSTRIES

- Label control.
- Bottling inspection.

Our Service

Turnkey **Solutions**

- Analysis of the customer's quality control needs and co-definition of specifications and scope.
- Development of custom chemometric predictive models for greater accuracy and robustness, compared to generic libraries.
- Integration service (including compatibility with existing plant data management systems).
- Maintenance and after-sales service during the entire life cycle of the device.
- Exploratory tests in our facilities.
- Maximum flexibility for adapting the device to meet specific requirements.
- On-site validation and training

Testimonials

The use of the VISUM Palm represents a huge revolution in terms of keeping the quality of the processes under control. It brings us real-time and reliable information and cost-saving data about total acidity and the content of the polar components in the frying oil of the production line. VISUM Palm also gives us useful data to determine the quality of fried products, like moisture and fat percentages. This functionality helps to save on arduous lab tasks and allows our employees to focus on other high value-added duties. The return on investment is clear and well founded.

Marina Diana
Scientific Research Manager
EUROPASTRY, S.A.

Thanks to the good work done between the teams of IRIS Technology and GESCASER, we have been able to get a great benefit from the end-to-end solutions development they have done for us with CTC+, a software capable of providing very detailed information of the stored grain quality as well as adding a prediction system, based on artificial intelligence tools, which learns from previous experiences in the silo, improving the efficiency of the ventilation system. For GESCASER, this software has been a qualitative leap that our customers have been grateful for.

Amadeu Casañé
Chief Executive Officer
GESCASER

At Almirall, we are committed to quality, innovation and the continuous improvement to make our processes more effective and efficient. For this reason, last year we incorporated into our quality control laboratory the new VISUM Palm analyzer, intended, in our case, for the online determination of different quality parameters in multiple products.

Thanks to the excellent communication between IRIS Technology Solutions and Almirall, the process of developing the Machine Learning models and qualifying the device for our technical requirements has been fluid and agile. At Almirall, we know that this is only the first step on a prosperous path together with IRIS towards the implementation of other PAT solutions, framed in our commitment to the Industry 4.0 paradigm.

José Martínez
Industrial Pharmaceutical Development Manager
Almirall

The development proposal we jointly presented was highly challenging. Despite the unforeseen and technical/scientific difficulties, a higher than expected target was achieved and today BIMBO Iberia has Visum equipment that we use to achieve our mission “to make delicious and nutritious food”.

Juan A. Mena Gil
I+D
Bimbo Iberia

All and all, VISUM Palm is a solid piece of equipment that is portable, user-friendly and has a lot of potential. We and Prof Elliott’s team are working in the area of food authenticity and vegetable oil speciation for a number of years now and looking for opportunities to make the analysis fast, portable and cost-effective. With the right application the VisumPalm ticks all the boxes.

Dr. Tassos Koidis’ team
Research Leader and Lecturer in
Food Science and Nutrition
Queen’s University Belfast

Under the framework of the EU funded H2020 project, Agrimax, in Nofima we have been testing the feasibility of selected rapid and non-destructive sensors for monitoring and controlling different extraction processes. Testing the dry matter content in cutin paste monitoring, an expensive and high-resolution lab instrument from a leading brand has been compared with the hand-held VISUM Palm, yielding strikingly similar results.

While both systems were capable of performing the analysis with the same level of accuracy, the VISUM PALM offers the added advantage of measuring on a quite small spot, thereby enabling high-quality spectra to also be obtained from hard and bulk samples.

Dr. Jens Petter Wold
Senior Scientist
NOFIMA

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VISUM SOLUTIONS

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