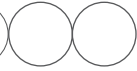ANTARES VISION GROUP
LIFE SCIENCE

DIAMIND | LINE

INSPECTION SYSTEMS

IMPORTANCE OF VISION INSPECTION IN THE PHARMACEUTICAL INDUSTRY

In the pharmaceutical sector, where product safety and quality stand as paramount considerations, the practice of visual inspection becomes indispensable during the manufacturing phase. This stringent commitment to maintaining the highest standards ensures that pharmaceutical products meet rigorous safety and quality criteria.

Vision inspection systems leverage cutting-edge technology to meticulously **identify defects, contaminants, and any anomalies that could potentially compromise the integrity of pharmaceutical products.** These systems are specifically designed to detect issues that may not be perceptible to the human eye. Their outstanding precision, efficiency, and unwavering consistency render them invaluable assets across various facets of pharmaceutical operations, including quality control, sorting, automated inspection, and a multitude of other applications.

Unlocking the Advantages of Vision Inspection in Pharmaceutical Packaging Quality Control

In today's pharmaceutical industry, **vision systems have assumed a pivotal role**, offering a cost-effective means to guarantee precision and uniformity throughout the manufacturing process. Here, some of the main **quality control benefits** that vision inspection technology offers to pharmaceutical enterprises.

1. Ensuring Patient Safety
Vision inspection systems in the pharmaceutical industry reduce the risk of defective or contaminated products reaching patients by identifying foreign particles, contaminants, and labeling errors. These systems ensure compliance with standards, prevent tampering, and prioritize patient safety.

2. Unparalleled Precision
Vision systems surpass manual inspection, eliminating human errors and increasing efficiency.

They accurately process large data volumes, detecting subtle defects and ensuring products meet stringent regulatory standards.

3. Enhanced Productivity
Vision systems streamline inspections, boosting productivity by quickly identifying defects and reducing manual labor reliance. This improves production line efficiency and generated cost savings.

4. Cost-Efficiency
Automated vision inspection reduces manual labor and associated costs, mitigating risks of damage or contamination. Companies benefit from faster batch processing, lowering rework expenses and increasing profit margins.

5. Improved Data Integrity
Vision systems capture precise, comprehensive data, enhancing quality control and production monitoring. This reduces errors and improves manufacturing efficiency, ensuring product safety and compliance.

6. Business Reputation and Customer Confidence
By quickly identifying packaging errors, vision systems help avoid costly recalls and enhance customer confidence in product reliability. Automated systems boost accuracy, efficiency, and safety, ultimately improving company reputation and customer trust.

ENSURING PRODUCT INTEGRITY, SAFEGUARDING PUBLIC HEALTH
At **Antares Vision Group**, we understand the critical role that visual inspection systems play in the Life Sciences ecosystem. We are dedicated to delivering innovative and reliable **solutions that empower our partners to maintain the highest standards** of product integrity and patient safety.

SEAMLESS INTEGRATION
Our inspection systems integrate seamlessly into your operations, working with third-party machines to ensure your product integrity is never compromised. We offer flexible, adaptable solutions tailored to your needs.

PRECISION THROUGH VISION

Precision is critical in Life Science. Our vision systems guarantee the quality of individual units (pills, capsules, vials, ampoules) and final packaged products (bottles, cartons, tubes), ensuring non-conforming components are rejected.

SECURE PACKAGING CONTROL

We offer diverse solutions for product and packaging inspection, including **AI-enhanced** technology, to enhance your quality control efforts.

YOUR TRUSTED PARTNER

At Antares Vision Group, our success is tied to yours. Our high-quality solutions improve efficiency and streamline your business operations, ensuring product integrity and public health remain priorities.

We look forward to partnering with you on your journey to excellence in the Life Science industry.

STOPPER:
- Quality check
- Raised Detection
- Top datamatrix control
- Pattern matching

OCR/OCV

MIX-UP / VAGRANT

CRIMPING

COLOR

SKEWED LABEL

GEOMETRY

INTEGRITY

SHAPE

COLORED RINGS

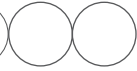IMPURITY

DATAMATRIX BARCODE

FOIL

PRESENCE / ABSENCE

LOGO

TAMPER EVIDENT

LABEL

OCV/OCR

OCR (Optical Character Recognition) and OCV (Optical Character Verification) are technologies used to interpret printed text. OCR is employed to decipher unknown text, comparing a character image to predefined fonts for identification. OCV, on the other hand, assesses print quality by comparing a known text to a reference image. While OCR is geared towards determining the closest match for each image section, OCV focuses on evaluating print quality based on predefined reference characters. Both technologies play crucial roles in global traceability compliance, ensuring accurate serialization of product information, including production date and batch details. They also facilitate quality control over labels, packaging, and sealing foil.

1D/2D CODE

A barcode is a machine-readable pattern applied to products, packages, or parts. Barcodes contain data used for informational purposes as well as for tracking products throughout their lifecycle. Barcode reading is a critical component of track-and-trace initiatives, utilizing 1D or 2D barcodes as unique identifiers on products. These barcodes facilitate seamless tracking throughout the supply chain, as they can ensure visibility from production to end-users. Efficient decoding processes and enhanced system performance are essential for effective communication. While 1D barcodes contain alphanumeric data, 2D codes offer increased data capacity by storing information both horizontally and vertically. In the pharmaceutical industry, Data Matrix codes have become standard for compliance with global track-and-trace regulations due to their suitability for small packages and approval by GS1 for regulated healthcare items. Moreover, these checks are typically conducted on labels, packaging, and sealing foils.

PRESENCE/ ABSENCE

The presence or absence of an object is one of the fundamental, simple yet essential quality controls. Verifying the presence or absence may relate to a product, as in the case of blister packs with empty cavities (lacking tablets), or the presence or absence of a flip-off cap on a vial. It can also pertain to various checks related to packaging, such as confirming the presence of a label, leaflet inside a box, or a thermoformed tray containing ampoules or vials. This extends to ensuring the correct filling of a case with individual cartons.

COLOR

The color control is often a crucial aspect to ensure the consistency of the product. In the pharmaceutical field, color is used to distinguish between different products, whether they are distinct medications or even to differentiate the same drug with different active ingredient dosages. Color is the element that often characterizes various flip-off caps on vials, while ampoules may have an identification system with colored rings. The life science secondary packaging is also sensitive to the correct use of color, making it important to be able to verify the correctness of the packaging on production lines.


DIMENSION

Dimensional and shape control are critical inspections, whether conducted directly on individual products, such as tablets, or on labels, or even on product components, such as verifying the correct size and position of plungers and pistons in the case of syringes, or stoppers and flip-offs in the case of vials.
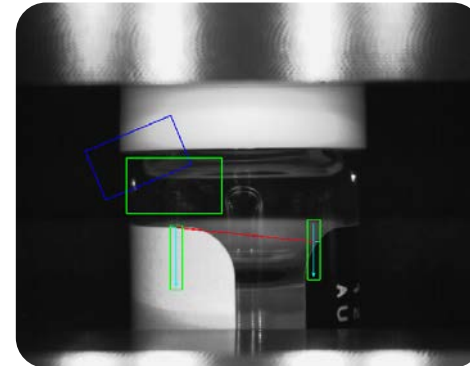

SKEWED LABEL

Verification of label presence and accurate placement on the packaging. This control ensures precise alignment, rotation, and positioning by measuring the distance between designated points, preventing any misalignment. We also inspect proper label adhesion, detecting and identifying issues such as creases, air pockets, and tears.
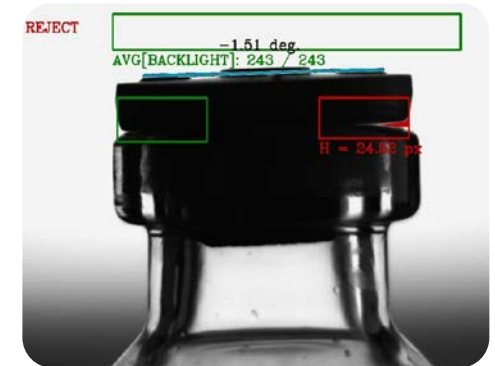

RAISED STOPPER DETECTION

Our raised stopper detection system checks for the presence and correct positioning of the stopper, ensuring proper stopper alignment in vials to guarantee that each vial leaving the filling station is securely sealed. This ensures a tight seal on the glass vial, preventing any potential leaks or contamination. If a stopper is missing or improperly aligned, the system immediately flags it as a defect. Failure to properly seat the rubber stopper on a vial before it enters the capper can lead to significant issues. It may result in the stopper being dislodged, causing product spillage, or it could be reseated improperly, potentially compromising sterility without detection.

LOGO

IMPURITY CHECK

INTEGRITY
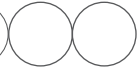
Our products offers a comprehensive control solution for logo print quality. Through visual inspection, an image is captured via a camera, and our software, utilizing advanced algorithms, evaluates the fidelity of the logo reproduction. Ensuring the accurate reproduction of a logo is crucial for maintaining brand integrity and consistency. A logo serves as the visual representation of a company's identity, values, and reputation. Any deviation or inconsistency in its reproduction can undermine brand credibility and trust. By meticulously verifying the quality of logo printing, our solution helps businesses uphold their brand standards, enhance customer perception, and safeguard their brand equity. The process involves analyzing pixel-by-pixel variations across a batch of N images,

with at least 20 correct reference images. This results in two reference images: one representing minimum values and the other representing maximum values generated by the images' pixels. During production, each individual image is compared pixel by pixel to these reference images, representing the tolerance range plus any set acceptability threshold. Differences in individual pixels form closed shapes with a certain area, which can be filtered based on minimum area to ensure the elimination of any potential deviations.
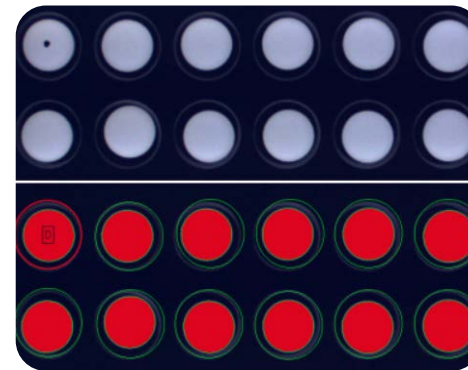
The 'impurity check' is a crucial inspection process, particularly for tablets, where we aim to identify any defects, such as black spots or marks, ensuring the highest quality and purity standards are met.

The integrity check can be conducted directly on a product, such as tablets, to ensure there are no breakages or chipping. Similarly, we perform integrity checks on glass, as in the case of vials, where we verify integrity on the vial mouth and body, as well as on the crimping integrity.
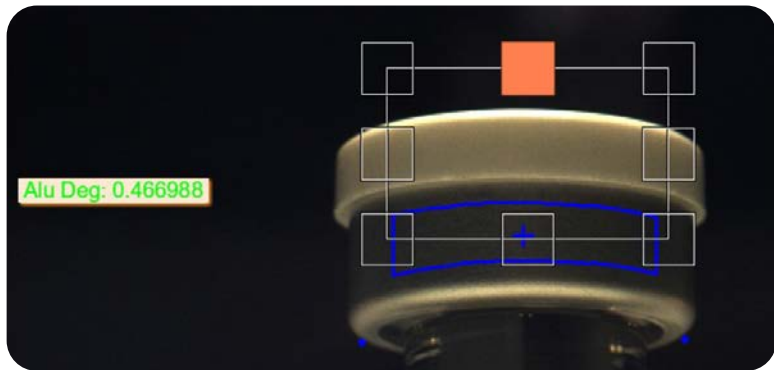
CRIMPING

The Crimping Quality inspection system specializes in analyzing vials with ring nuts. Its purpose is to meticulously verify the integrity, quality, and correctness of ring nuts and flip-offs during the sealing phase of pharmaceutical vials. The analysis entails acquiring a series of images for each vial. Through image processing, the software isolates the crimping and flip-off area to ensure its accuracy.

The inspection system conducts the following controls:
• Flip-off check
• Crimping quality assessment
• Detection of defects on the ALU seal

The search for defects on the ring nut body employs three distinct functions:

• Defect Dark Image: Identifies defects on the underexposed image (preset 1) by detecting transitions from a Sobel filter. If any defects are identified by this function, the subsequent two functions are not applied.
• Defect Light Image: Identifies defects on the overexposed image (preset 0) by detecting transitions from a Sobel filter.
• Deviation Defect: Searches for defects on the overexposed image using a deviation filter.
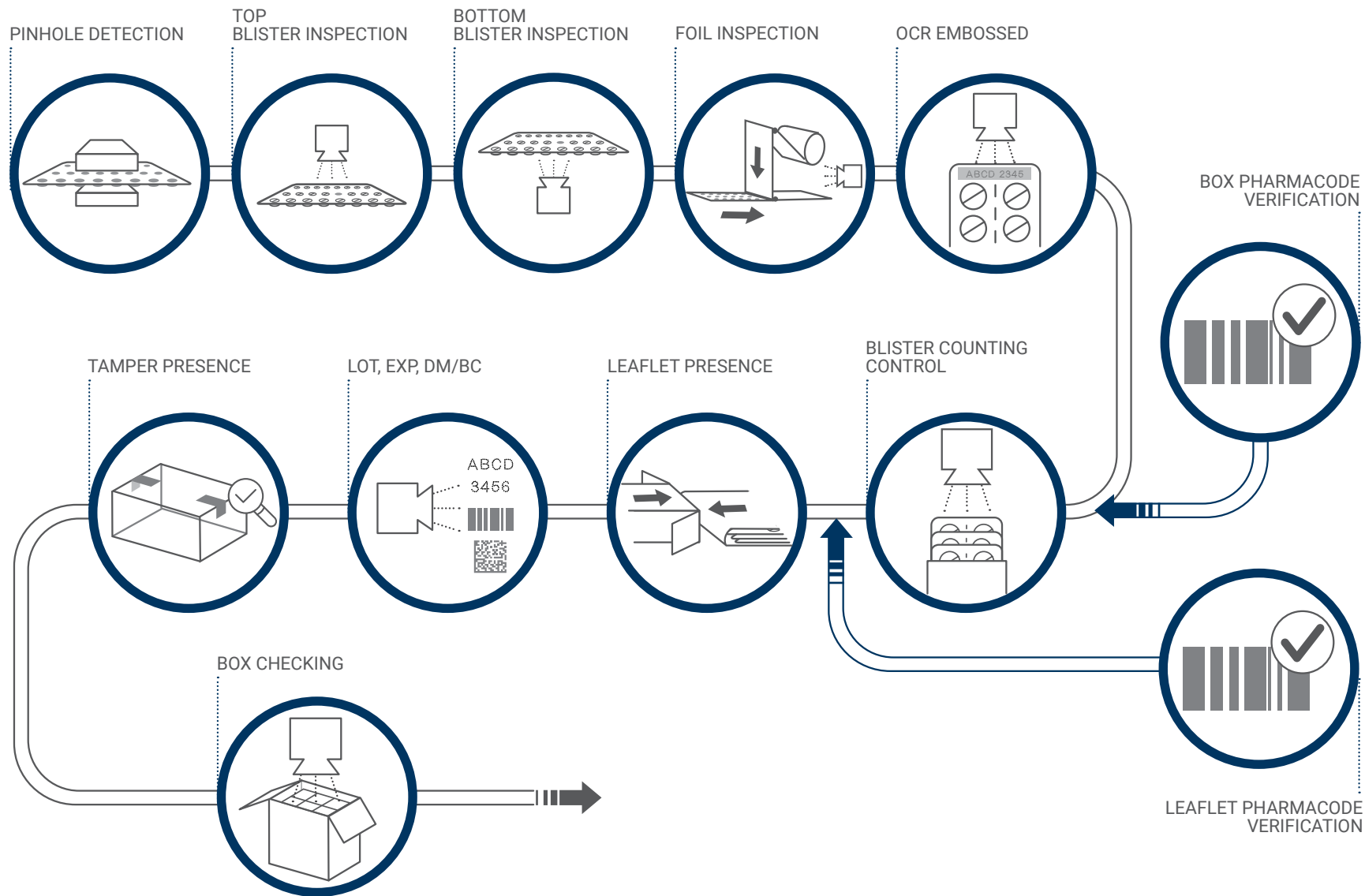

STOPPER QUALITY CHECK

Pharmaceutical rubber stoppers serve as secure, flexible closures for vials. When a vial is filled with medication, it is sealed with a rubber stopper. Controls on rubber stopper quality, performed through specifically designed software and hardware solutions, include the detection of impurities and the verification of pattern presence and its correctness.
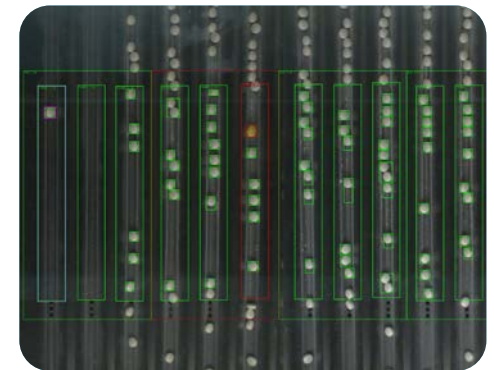
MIX-UP / VAGRANT

This inspection control addresses mix-ups, vagrant, or extra products, representing a critical and vital aspect of our inspection process. Accurate product positioning is essential to ensure proper packaging integrity. However, its significance escalates when identifying foreign products. For example, similar tablets with varying active ingredient dosages present a significant risk if not detected promptly. Hence, identifying foreign products is imperative to uphold product safety and integrity.

INSPECTION SYSTEMS - Blister

PINHOLE DETECTION

TOP BLISTER INSPECTION

BOTTOM BLISTER INSPECTION

FOIL INSPECTION

OCR EMBOSSED

ABCD 2345

BOX PHARMACODE VERIFICATION

TAMPER PRESENCE

LOT, EXP, DM/BC

ABCD 3456

LEAFLET PRESENCE

BLISTER COUNTING CONTROL

LEAFLET PHARMACODE VERIFICATION

BOX CHECKING

INSPECTION SYSTEMS - Syringes

PLUNGER CHECK

SYRINGES ACCURACY CHECK

FOIL INSPECTION

OCR EMBOSSED

ABCD 2345

BOX PHARMACODE VERIFICATION

TAMPER PRESENCE

LOT, EXP, DM/BC

ABCD
3456

LEAFLET PRESENCE

BLISTER COUNTING CONTROL

BOX CHECKING

LEAFLET PHARMACODE VERIFICATION

INSPECTION SYSTEMS - Vials

RAISED STOPPER DETECTION

STOPPER QUALITY CHECK

CRIMPING QUALITY

SIDE TEXT CONTROL

QWERTY

TOP DM CONTROL

SKEWED LABEL INSPECTION

LABEL PRESENCE

LABEL TEXT CONTROL

VITAMIN SUPPLEMENT
Support Immune System

ANTARES VISION GROUP

MIXING VIALS

LEAFLET PRESENCE

LOT, EXP, DM/BC

ABCD
3456

TAMPER PRESENCE

BOX CHECKING

BOX PHARMACODE VERIFICATION

LEAFLET PHARMACODE VERIFICATION

UPI

UNIVERSAL PACKAGING INSPECTOR
A suite of high-performance cameras and software licenses designed to ensure full control of the packaging process in the pharmaceutical industry. The AV Universal Packaging Inspector is completely scalable, versatile, and can be enhanced by AI.

BENEFITS
Easily integrated into packaging lines and third-party equipment.
Compliance with GMP regulations (e.g., GAMP 5 rules, FDA 21CFR part 11, and Resolution RDC ANVISA No. 301/2019).
Track & Trace ready, ensuring a long-term investment.

DISTINCTIVE FEATURES
Highly customizable system, with the possibility of tailored controls and ad hoc function development.
Supported by a wide range of camera models for a complete inspection of all printing layouts.
Can be upgraded with Neural OCR AI-powered technology, providing additional capability for challenging scenarios for traditional OCR.

A SOLUTION TAILORED TO EVERY NEED
The AV Universal Packaging Inspector allows achieving the highest packaging and labeling quality and integrity standards.
The available controls depend on the type of license installed. Each of them can be combined with one of the many cameras available to guarantee the perfect solution in any production context.

MAIN CONTROLS
- OCR-OCV INSPECTION
- PRINTED LOGO INSPECTION
- CARTON PHARMACODE INSPECTION
- SEAL INSPECTION
- BARCODE INSPECTIONS
- DATAMATRIX INSPECTION

AEC

AV EASY CHECK
Antares Vision Easy Check is a software solution designed to ensure control of the packaging process in the pharmaceutical industry. AEC is able to identify color variations on pharmaceutical products by analyzing the images taken by Antares Vision control cameras.

MAIN CONTROLS
- AREA CONTROL: Allows you to check for the presence of a specific color area (e.g., the presence of a cap).
- HOMOGENEOUS AREA: Allows you to check for changes in color homogeneity (uniformity) (e.g., integrity of a vial, label presence, etc.).
- BLOB CONTROL: Allows you to check for the presence of color sections larger than a certain parameter in a specific area.
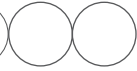
SQC

STOPPER QUALITY CHECK
A software and hardware kit designed to inspect rubber stoppers on pharmaceutical vials.

MAIN CONTROLS
- Impurity Check
- Presence and correctness of the pattern

BFC

BLISTER FILLING CONTROL

The solution designed to remove the risk of intermingling, vagrants, and/or excess products by inspecting the complete blister surface, including the part outside of the pocket.

The processing power of the unit allows for extremely accurate control, with speeds faster than any other blistering machine available on the market. Production efficiency is therefore always guaranteed.

BFC can be integrated with all classic controls along the line, including AVPI on the lidding foil and/or PQC (BarCode Reader and OCV/OCR) on leaflets, cartons, and labels, as well as Box Checking for correct case-packing verification. It also integrates with the Antares Tracking System for production traceability.

WORKS WITH ANY KIND OF CAPSULE AND TABLET
- Tablets
- Mono and bi-color capsules
- Hard and soft gelatines
- Printed and embossed products

WORKS WITH ANY KIND OF SUPPORT MATERIAL
- Transparent PVC
- Colored PVC
- Opaque PVC
- Polypropylene, PVDC, alu-alu

MAIN CONTROLS
- Counting
- Color correctness
- Mix-up, vagrant, or extra products
- Geometry accuracy (area, contour, major/minor axis)
- Shape accuracy
- Detection of spots or marks
- Detection of cracks and breaks

Mix-up, vagrant, or extra products

AVPI

AV PRINT INSPECTOR

Dedicated system designed to be integrated with any labeling, printing, or packaging machine to provide inline complete layout inspection of web and labels.

Designed to provide 100% inspection for today's cutting-edge print-on-demand technology - High-speed inspection up to 80 meters/minute (260 feet/minute)

Inspection can be learned on-the-fly or with reference to an imported image

Supports all major vision system tools to control layouts (1D/2D barcodes, OCR/OCV, pattern matching, color check, measurements)

Inspection format can be created directly by operators using a wizard interface - no need for coding or vision experience

Recipe management with virtually infinite storage capacity

Capable of generating batch reports and audit trail reports (21CFR/11 compliant)

Easy to integrate into new and existing equipment

MAIN CONTROLS / DETECTABLE DEFECTS
- DOTS
- MARKS
- SMUDGES
- POOR PRINTING
- LIGHT & DARK LINES
- MISSING LINES
- WRONG COLOR
- WRONG OR MISSING BARCODE
- WRONG OR MISSING HUMAN-READABLE DATA

SACC

SIDE ALPHANUMERIC CODE CONTROL

Software and hardware kit designed to determine the content of printed text and assess the quality of a printed image on a vial's crimp. It is specifically designed to control the text on the vial's aluminum crimp.

MAIN CONTROLS

- OCR (Optical Character Recognition)
- OCV (Optical Character Verification)

CQC

CRIMPING QUALITY CONTROL

Inspection system designed to analyze vials with ring nuts. Its purpose is to specifically check the integrity, quality, and correctness of ring nuts and flip-offs during the sealing phase of pharmaceutical vials. The analysis is carried out by acquiring a series of images for each vial. By processing these images, the software is able to isolate the crimping and flip-off area to check its correctness.

MAIN CONTROLS

- Flip-off check
- Crimping quality
- Defects on ALU seal

The search for defects on the ring nut body is based on three distinct functions:

1. Defect Dark Image: The main function identifies defects on the underexposed image (preset1) by searching for transitions from a Sobel filter. If this function identifies at least one defect, the following two functions will not be applied.

2. Defect Light Image: This function identifies defects on the overexposed image (preset0) by searching for transitions from a Sobel filter.

3. Deviation Defect: This function searches for defects on the overexposed image using a deviation filter.

RSI

RAISED STOPPER INSPECTION

A software and hardware kit designed to identify stoppers that are not wholly adhered to the vial collar. The system features a 1mm detection threshold and can inspect up to 300 units per minute. The module is compatible with a wide array of vials, spanning from 10-300ml with a 20-32mm cap range.

MAIN CONTROLS

- Stopper Presence
- Stopper Position

PIC

PACKAGE INTEGRITY CONTROL

A software and hardware kit designed to inspect pharmaceutical products such as syringes, ampoules, bottles, or vials in trays.

Through its inspections, the PIC system can verify:

MAIN CONTROLS

Presence and integrity, in particular:
- Replenishment package
- Syringes with needle and cap
- Caps and flip-off closures
- Integrity of glass and plastic products

Shape verification:
- Product shape
- Geometry (area, contour, major/minor axis)

Color verification:
- Product color
- Rings on bottles/vials/ampoules
- Unicolored internal parts, such as pistons and syringe caps

DIAMIND

POWERING PRODUCTS AND SUPPLY CHAINS

DIAMIND IS THE INTEGRATED, INTELLIGENT ECOSYSTEM OF SOLUTIONS TO POWER PRODUCTS AND SUPPLY CHAINS, ENABLING A DATA-DRIVEN AND TAILORED JOURNEY TO DIGITAL INNOVATION.

Connecting physical products with digital identities, DIAMIND runs at the line, factory, warehouse, enterprise, and supply chain levels, and guarantees product quality (inspection systems and equipment) and end-to-end traceability (from raw materials to production, from distribution to the consumer and back) through integrated and cloud data management.
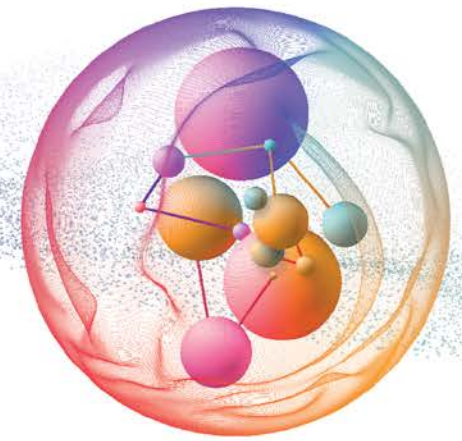
DIAMIND

LINE

FACTORY

WAREHOUSE

ENTERPRISE

SUPPLY CHAIN

powering innovation

Expresses the potential of integration within DIAMIND's suites at multiple levels, shaping future growth

DIAMIND | LINE

· Track & Trace Ready

DIAMIND | FACTORY

· Ai empowerment for visual inspection
· Real-time oee monitoring: loss and waste analysis

ANTARES VISION GROUP

EXPERIENCE THE POWER OF TRUSTPARENCY®