ANTARES VISION GROUP
LIFE SCIENCE

DIAMIND | LINE

INSPECTA

UNIFIED INTERFACE FOR VISION INSPECTION

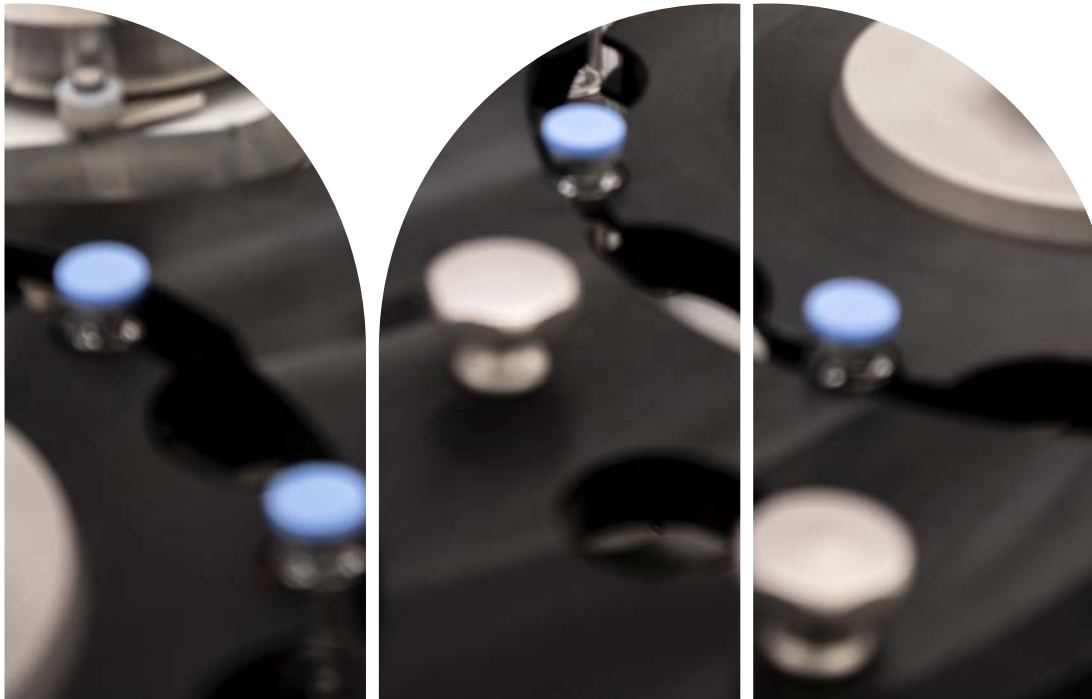
INSPECTA: THE POWER OF A **UNIFIED INTERFACE** FOR VISION INSPECTION

In the highly regulated pharmaceutical industry, ensuring **product integrity** and **patient safety** is paramount. Vision inspection systems play a critical role in this mission by meticulously identifying **defects, contaminants and anomalies** that might compromise pharmaceutical products.

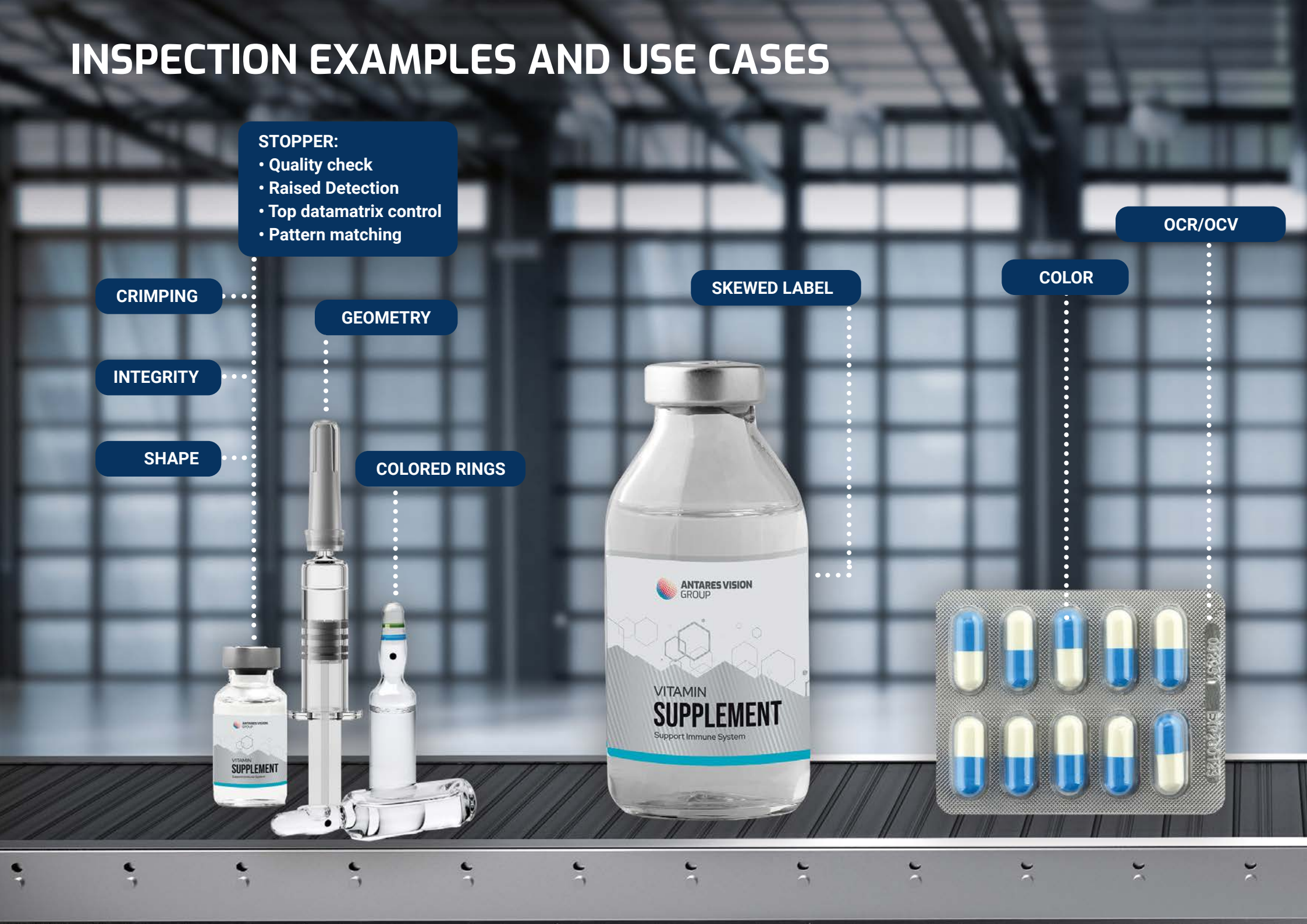
Antares Vision Group brings decades of expertise in delivering specialized vision inspection solutions that **integrate seamlessly with primary and secondary packaging machinery.** Our new INSPECTA platform represents the latest advancement in pharmaceutical inspection technology - a **comprehensive, modular software suite** that unifies all inspection capabilities through a single intuitive interface.

Unlike previous approaches requiring multiple specialized software applications, with INSPECTA it is possible to **combine various inspection controls into mission-specific applications** to be implemented across the production line. This unified approach enables manufacturers to use a single platform to address both simple verification tasks and complex inspection challenges with higher efficiency and flexibility.

Supported by a wide range of standard **hardware components**, from vision sensors to line scan, area scan and smart cameras, INSPECTA's **intuitive interface, powerful algorithms and architecture** enables packaging machinery manufacturers to provide complete quality assurance solutions that meet the most stringent regulatory requirements, while maximizing operational efficiency.



INSPECTION EXAMPLES AND USE CASES



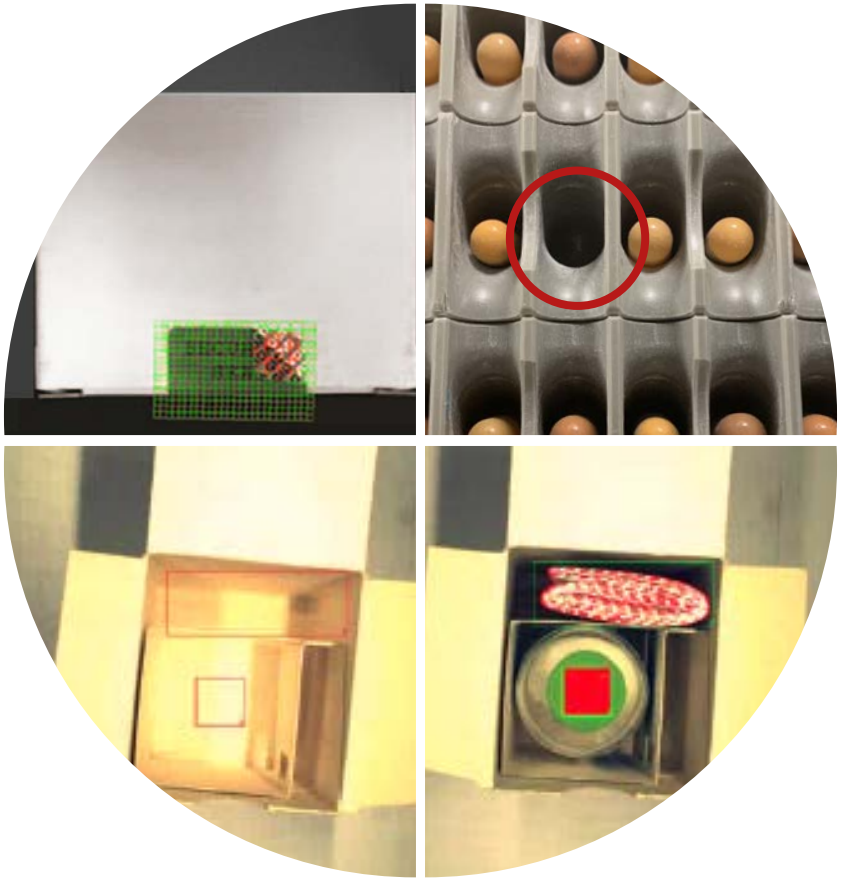

DATAMATRIX BARCODE
FOIL
PRESENCE / ABSENCE
LOGO
TAMPER EVIDENT
LABEL
ANTARES VISION GROUP
LONG PILL BOX
Medical Supplies
Extra Strength Formula
20 PILLS
VIA ORAL
750mg

QUALITY CONTROLS
OVERVIEW

PRESENCE/ABSENCE CONTROL

Presence/absence verification represents one of the most fundamental yet crucial quality controls in pharmaceutical manufacturing. This control ensures that **all necessary components are correctly included** in the final product, preventing potentially serious quality issues.

INSPECTA's presence/absence features employ advanced vision technology to verify that all required elements are **properly positioned** and that **no foreign objects or missing components** compromise the product. The system can detect even subtle discrepancies with exceptional precision and consistency.



Key Applications

- Confirming flip-off cap presence on vials
- Detecting proper label application on packaging
- Ensuring leaflet inclusion within cartons
- Verifying complete filling of cases with individual cartons
- Confirming presence of syringes within thermoformed trays
- Validating stopper presence on vials before crimping
- Detecting tamper-evident seals on packaging

The reliable detection of missing or unexpected elements provides critical quality assurance throughout the production process. By deploying applications based on this control, pharma manufacturers can **prevent costly recalls** and **protect brand reputation** while ensuring patient safety with every product that leaves the manufacturing line.

COLOR CONTROL

Color consistency is a critical quality parameter that extends beyond mere aesthetics in pharmaceutical manufacturing. Color variations often distinguish between **different products** or indicate **different dosage** strengths of the same medication, making precise color verification essential for patient safety.

INSPECTA's color control module employs sophisticated imaging and analysis algorithms to detect even subtle color variations against established references. The system can be set up to monitor specific color parameters including hue, saturation, brightness, and homogeneity across different product components.

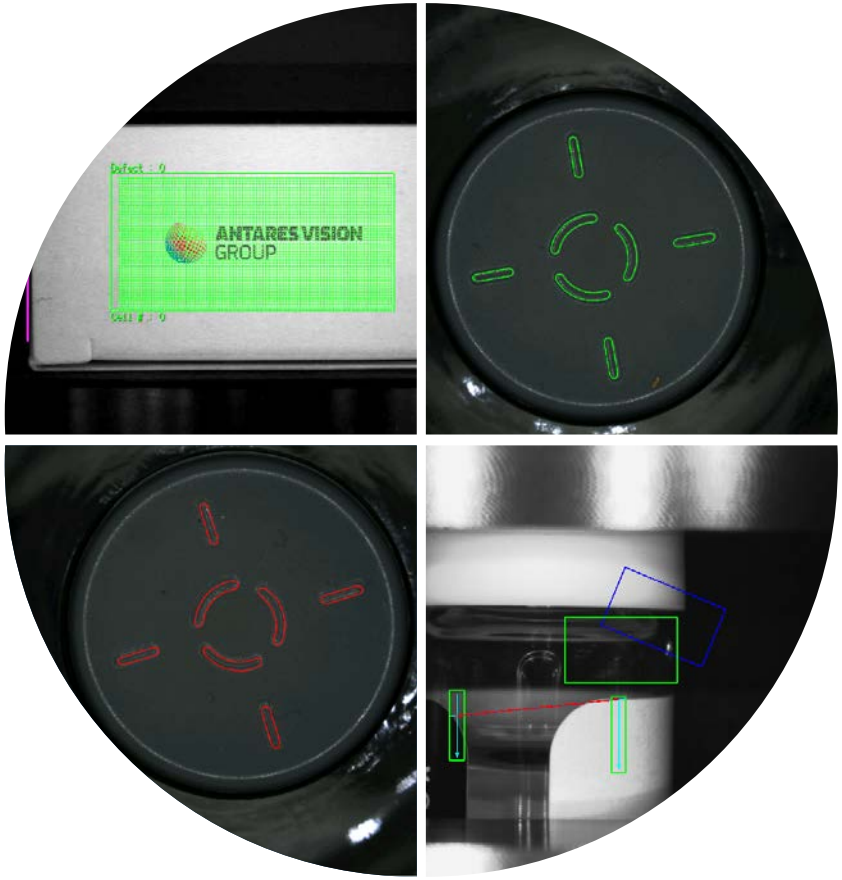
Color inspection provides immediate verification that the correct product is being processed, helping to prevent mix-ups between similar products with different active ingredients or dosages. By implementing rigorous color control, manufacturers establish an additional safeguard in their quality assurance process, enhancing both product integrity and patient safety.

Key Applications

- Verifying correct colored rings on ampoules for product identification
- Ensuring consistency of flip-off cap colors on vials
- Confirming correct ink color on printed packaging materials
- Detecting average color density in liquid medications
- Validating colored indicators on labels and packaging
- Checking cap and closure colors on syringes

PATTERN CONTROL

Pattern inspection serves as a sophisticated verification method that analyzes the visual characteristics and geometric patterns of pharmaceutical products and packaging. This control goes beyond simple presence checks by **comparing complex visual elements against reference images**, to verify print correctness and quality. INSPECTA's pattern recognition capabilities utilize advanced algorithms to analyze pixel-by-pixel variations across multiple reference images, establishing precise minimum and maximum tolerance parameters. The system identifies deviations from expected patterns, allowing for the detection of subtle defects that might otherwise go unnoticed.



Key Applications

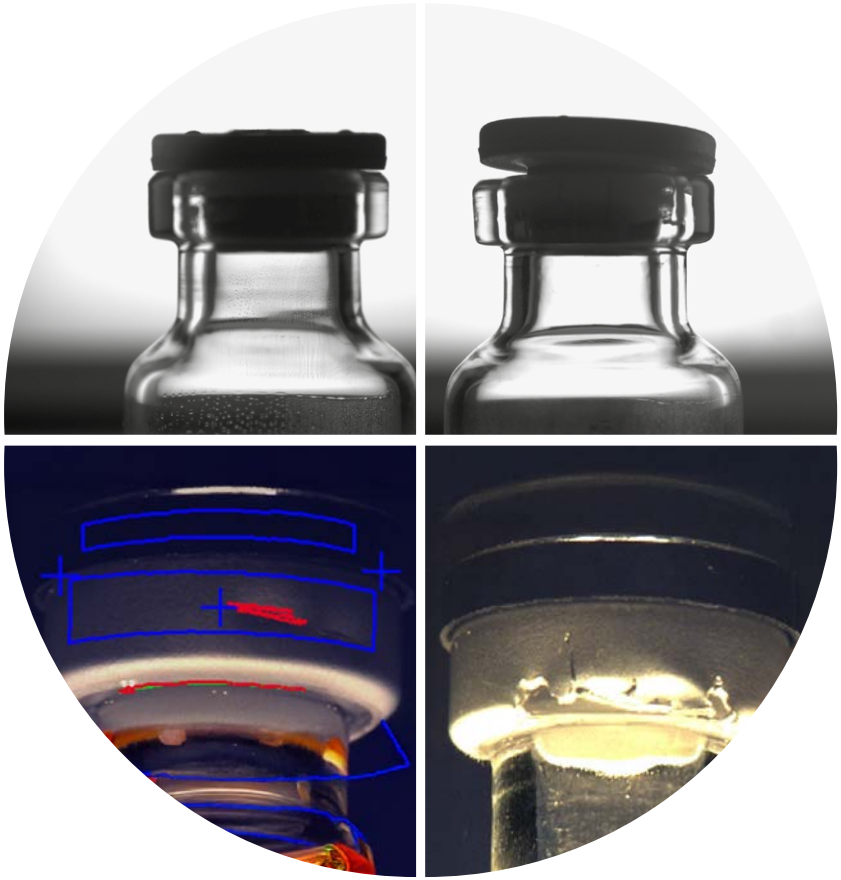
- Verifying logo print quality and consistency on packaging
- Ensuring proper rubber stopper pattern presence on vials
- Confirming accurate embossing patterns
- Detecting defects or deformations in blister packaging
- Validating holographic security features on packaging
- Checking label positioning and alignment
- Inspecting correct fold patterns in package inserts

During production, each inspection image is compared against reference parameters, with closed-shape analysis filtering potential deviations based on minimum area thresholds. This ensures comprehensive pattern verification while eliminating false rejections. By implementing pattern control applications managed by INSPECTA, manufacturers can support their brand identity while ensuring product consistency across all production runs.

DIMENSION/MEASUREMENT CONTROL

Precise dimensional verification is essential in pharmaceutical manufacturing, where even minor size variations can impact product efficacy, packaging integrity, or patient experience. Accurate measurement ensures that all components meet strict specifications throughout the production process.

INSPECTA's dimensional control module employs high-precision imaging and calibrated measurement algorithms to verify critical dimensions with high accuracy. The system can simultaneously evaluate multiple measurement parameters including l**ength, width, diameter, angle, and positional relationships** between components.



Each measurement is compared against predetermined tolerance ranges, with **customizable alert thresholds** that can be adjusted based on product criticality. By implementing dimensional control applications, manufacturers ensure that all components meet precise specifications, enhancing product quality, reducing waste, and maintaining compliance with regulatory requirements.

Key Applications

- Measuring label placement accuracy and skew detection
- Confirming proper stopper position and seating depth in vials
- Checking plunger and piston positioning in syringes
- Validating crimp dimensions and alignment on vial seals
- Detecting improper alignment of components in assemblies
- Ensuring correct folding dimensions of package inserts
- Monitoring blister pocket dimensions and seal widths

TEXT RECOGNITION (OCR/OCV)

Text recognition through Optical Character Recognition (OCR) and Optical Character Verification (OCV) provides critical verification of **printed information** on pharmaceutical products and packaging. This type of inspection ensures that all text elements are **present, readable, and contain the correct information.** INSPECTA's advanced text recognition capabilities utilize sophisticated algorithms to interpret printed characters from various font styles and printing methods. The system can be configured to either read unknown text (OCR) or verify expected text against a reference (OCV), with support for both standard and **deep learning-based** recognition methods.

Key Applications

- Verifying lot numbers, expiration dates, and manufacturing codes
- Confirming accurate product identification on labels
- Validating serial numbers for track-and-trace compliance
- Checking printed instructions and warnings
- Detecting print quality issues such as smudging or fading
- Reading embossed text on container surfaces
- Monitoring side text control on vial crimps
- Ensuring consistency in multilingual packaging

The system provides comprehensive print quality assessment by evaluating parameters such as **character completeness, contrast, positioning, and spacing**. This ensures not only that the correct information is present but also that it remains legible throughout the product lifecycle. By implementing robust text recognition, manufacturers ensure **regulatory compliance** and prevent potentially dangerous product mix-ups or incorrect information reaching patients.

CODE READING

Code reading capabilities provide essential validation of machine-readable codes that carry **product identification** information and are at the foundation of comprehensive **traceability solutions** - provided as well by Antares Vision Group – that ensure compliance with global serialization regulations.
INSPECTA's code reading module employs state-of-the-art decoding algorithms to reliably interpret both **1D and 2D codes (e.g. QR, datamatrix)** regardless of print quality variations. The system includes optional **in-line grading verification** that evaluates code quality with refence to industry standards like ISO/IEC 15415 and 15416.

The system can be configured to validate code content against expected formats or database lookups, ensuring that **each code contains the correct product information** and serialization data, in compliance with any type of supply chain traceability requirement.

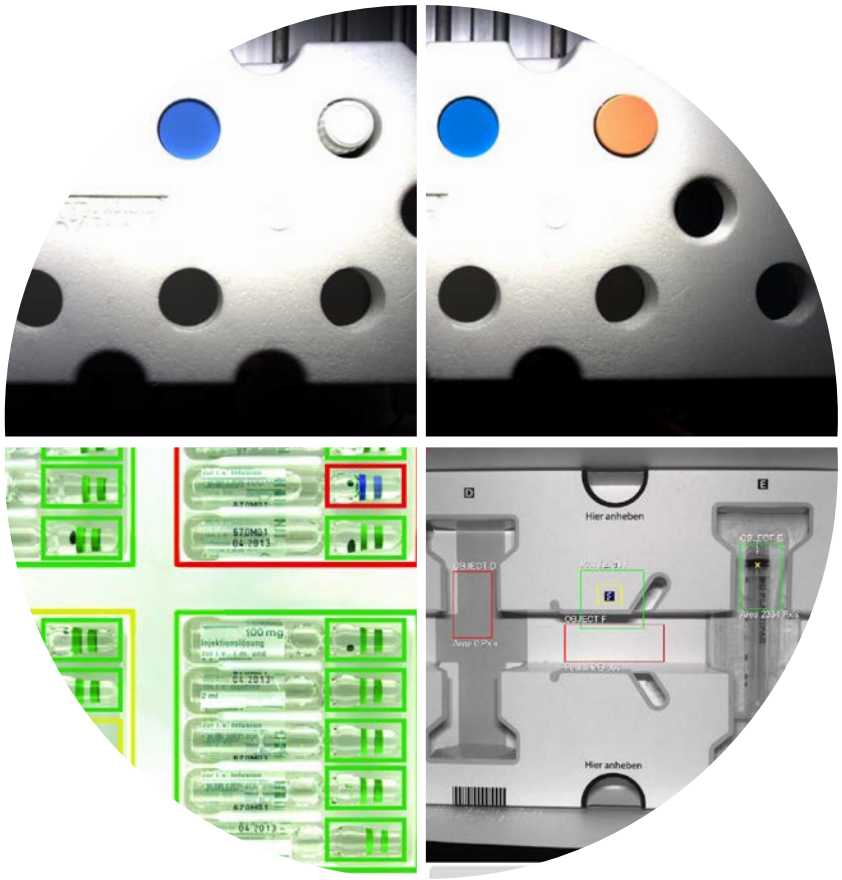
Key Applications

- Verifying data codes on vial tops and unit cartons
- Reading linear barcodes on labels and outer packaging
- Validating pharmacode correspondence on cartons and leaflets
- Confirming serialization codes match expected sequences
- Detecting print quality issues that might impact readability
- Reading codes on curved surfaces such as vials and bottles
- Verifying aggregation relationships between packaging levels
- Ensuring complete code information for track and trace compliance

MIX-UP CONTROL

Mix-up detection represents a critical safety control that identifies **foreign or misplaced products** within the production and packaging line. This inspection prevents potentially dangerous product mix-ups, ensuring that only the correct products reach patients.

INSPECTA's mix-up detection feature employs sophisticated image analysis and pattern recognition to identify unexpected variations in product appearance or positioning. The system can distinguish subtle differences between similar-looking products, providing an essential safeguard against **cross-contamination** between production batches.

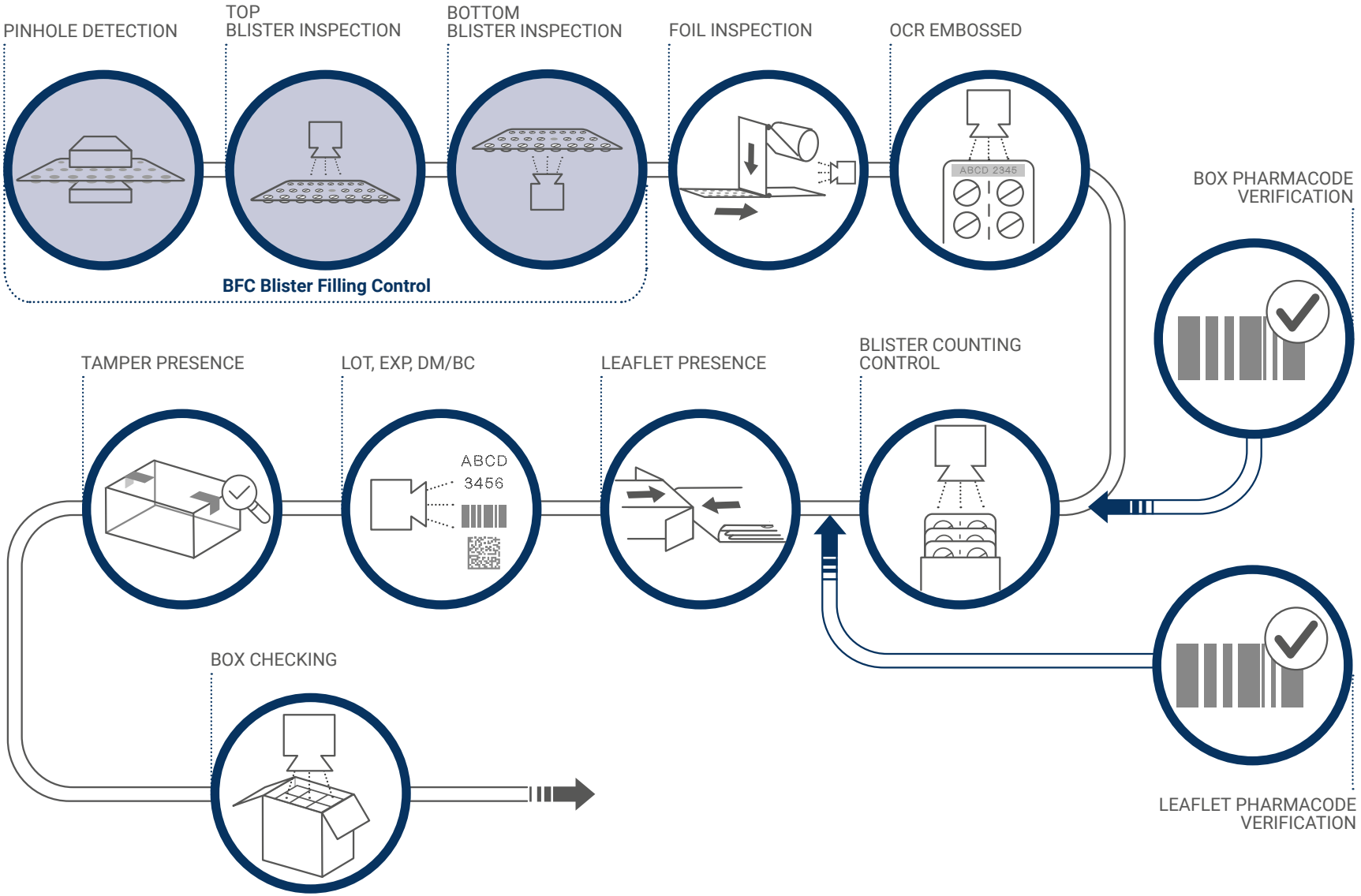


Key Applications

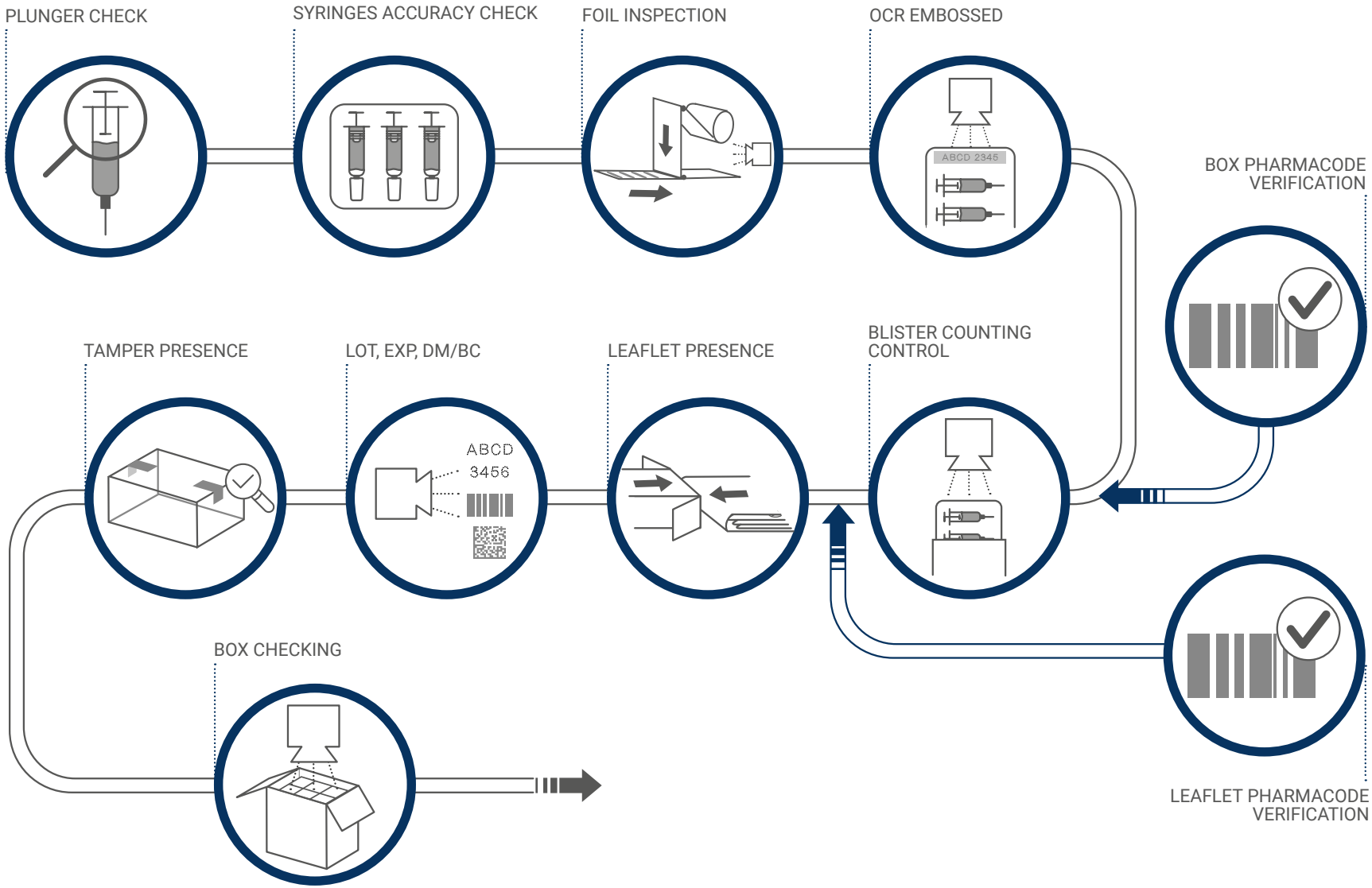
- Identifying incorrect vials or ampoules in product trays
- Verifying consistent product positioning in packaging
- Preventing cross-batch contamination during changeovers
- Confirming matching components within assembled products
- Detecting additional or "extra" products in packaging
- Identifying misplaced dosage strengths in multi-product packages

This control is particularly crucial when manufacturing similar products with different active ingredient concentrations, where visual differences may be minimal but clinical implications significant. By implementing mix-up detection on packaging equipment, manufacturers establish a critical quality gate that prevents **potentially dangerous product variations** from reaching patients, enhancing overall safety and compliance.

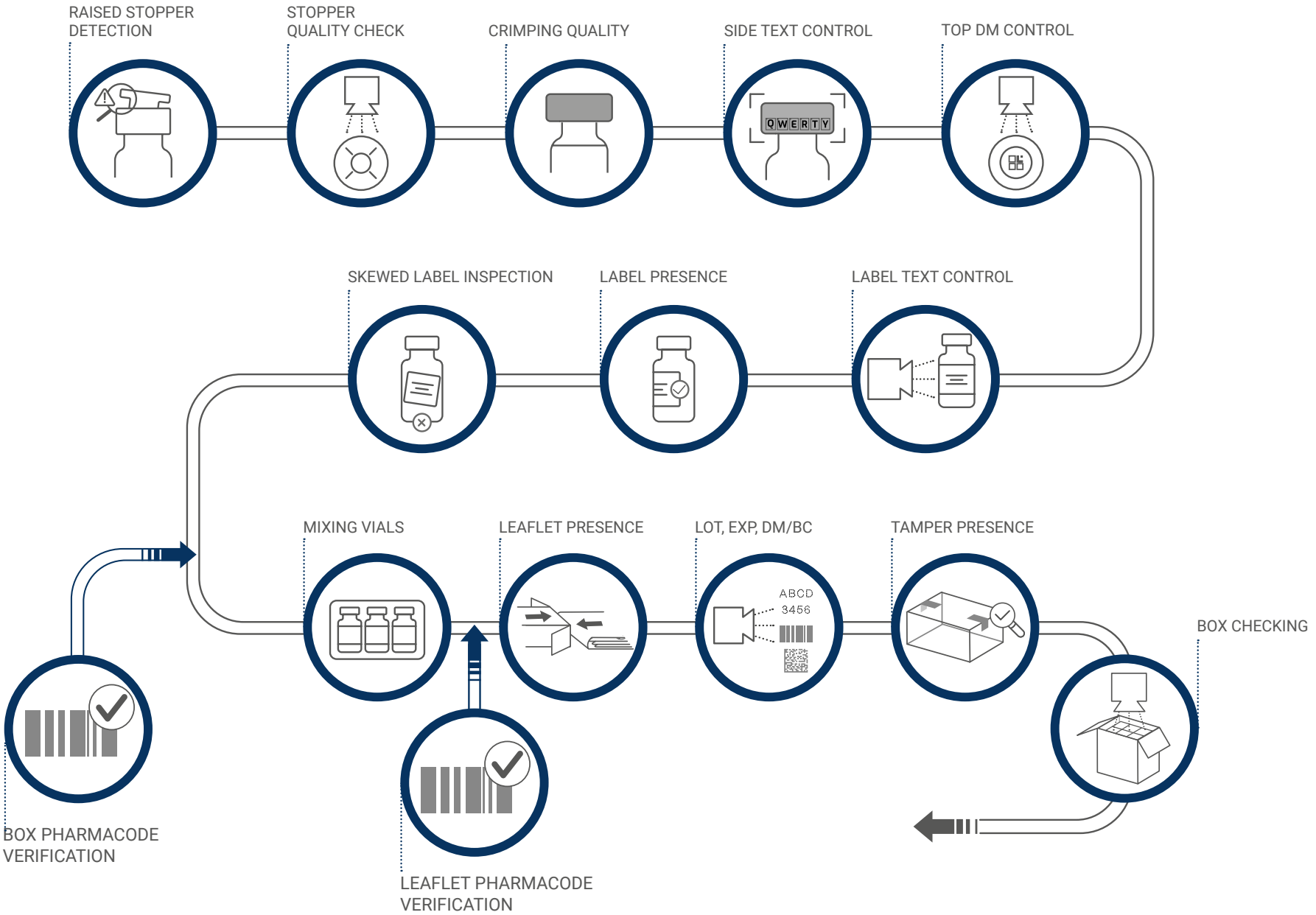
KEY APPLICATIONS - Blisters



KEY APPLICATIONS - Syringes



KEY APPLICATIONS - Vials

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A MODULAR AND SCALABLE SOLUTION FOR PHARMACEUTICAL INSPECTION

The new INSPECTA platform represents a revolutionary advancement in pharmaceutical inspection technology, replacing the fragmented approach of specialized software applications with a comprehensive, unified interface, for a new standard of flexibility and efficiency in inline quality control operations.

With INSPECTA, packaging machinery manufacturers can now offer their pharmaceutical clients a fully modular and scalable solution that **combines all inspection capabilities through a single intuitive interface**: a software architecture not only providing **seamless integration** with existing equipment, but also featuring **improved, powerful algorithms** that surpass the capabilities of legacy systems on specific functions.

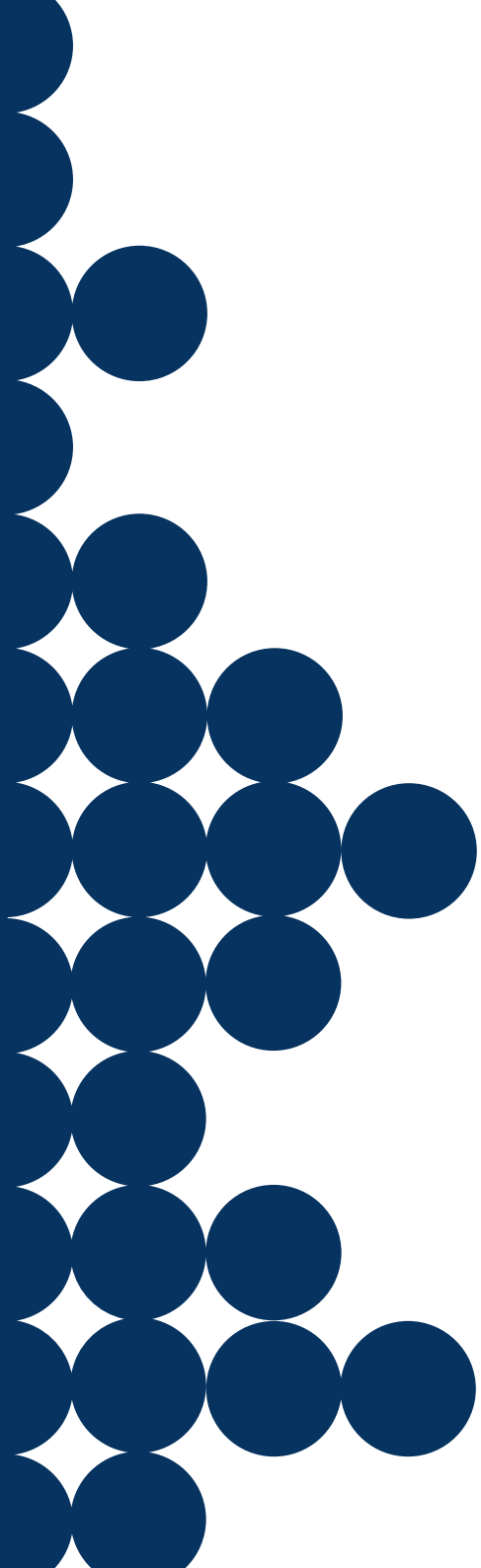
The **intuitive workflow** allows operators to quickly create inspection recipes and activate precisely the tools needed for each application.

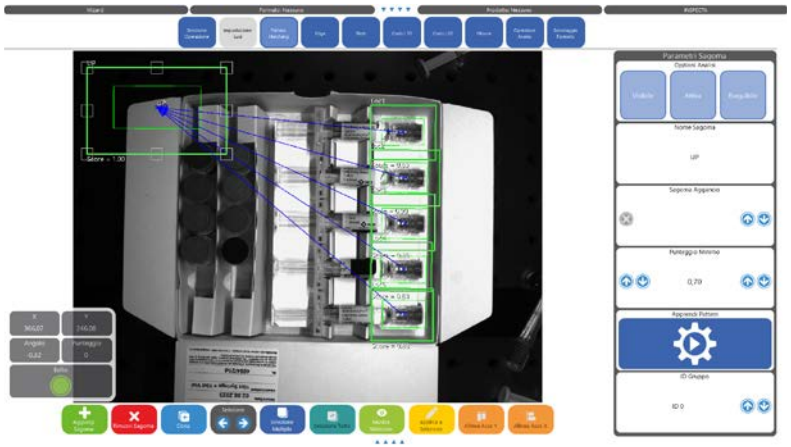
From basic presence verification to sophisticated AI-powered anomaly detection, all inspection capabilities are accessible through a consistent user experience that minimizes training requirements and maximizes productivity.

INSPECTA is designed to comply with **audit trail requirements** (21 CFR Part 11) to maintain detailed record of all user activities and to support validation requirements and regulatory compliance.

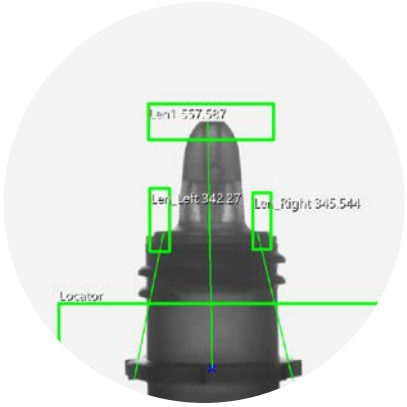
The platform's modular design ensures **future expandability**, protecting your investment as inspection requirements evolve.

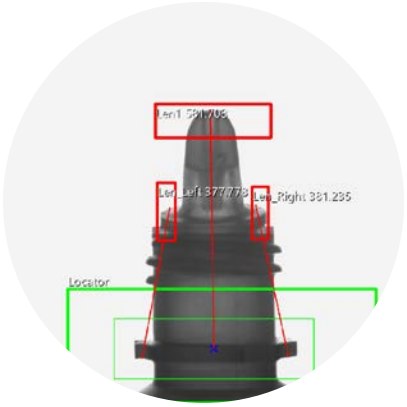
By partnering with Antares Vision Group and implementing the INSPECTA platform, packaging machinery manufacturers can provide their pharmaceutical clients with inspection capabilities that ensure product integrity and patient safety throughout the manufacturing process.

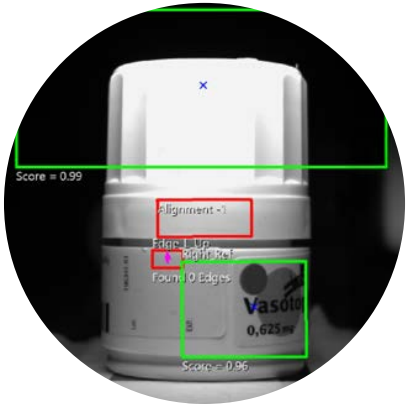




- ALL INSPECTION CAPABILITIES COMBINED INTO A SINGLE INTERFACE
- MODULAR AND SCALABLE FOR FUTURE EXPANDABILITY
- IMPROVED, POWERFUL ALGORITHMS TO SUPPORT INSPECTION FEATURES
- INTUITIVE WORKFLOW, CONSISTENT USER EXPERIENCE

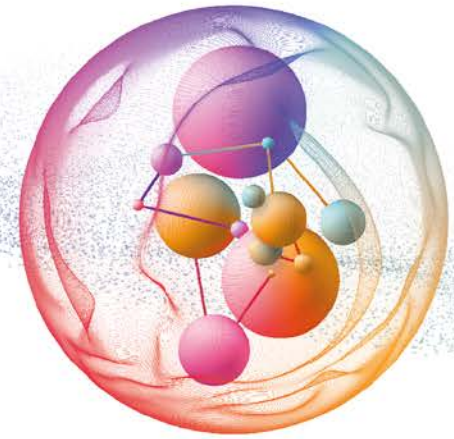






DIAMIND

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

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