

Quality Control Solutions

Vision Inspection





The concept of quality refers to the quality of products, services, processes and organizational procedures. A culture of quality is inherent in all companies in which there is an established quality awareness and quality-focused handling. This is also the case at Laetus, the industry leader of inline quality assurance

Our goal is reliability

Our core desire is our aim to offer our customers maximum reliability. After all, product failures can cause far-reaching damage to the image of your company and the health of the end user, and ultimately lead to business losses.

Control systems by Laetus offer a high level of reliability in fault detection on production lines and therefore seamless controls to check your product quality and packaging safety.

Experience creates quality

42,000+ cameras sold, 18,000+ systems installed globally, and 40+ years of experience have made us experts in packaging safety. Experience pays. We understand the industry and the processes and can therefore implement individual customer requirements as sustainable solutions.

Integration skills

Developing an inspection solution involves more than just setting up a camera. Delivering this requires expertise in mechanical image processing, electronics, automation and software implementation. Knowledge of applicable regulations and documentation requirements is just as crucial as detailed knowledge of network technology, server landscapes, and data management. Far-reaching integration skills across

all levels and systems involved is essential. Laetus is mastering this challenge with a diverse team of specialists and a global network of partner companies.

Continuity through development

For decades, Laetus has been using ARGUS standards - synonymous with reliable print control - for code reading. Regardless of whether it is simple code detection or additional color information, or human readable text or artwork needing to be reviewed, ARGUS, together with POLYPHEM and INSPECT, covers the entire range of product and packaging safety. POLYPHEM is more than fill control. It is the essence of experience from 2,000 installed systems. The functionalities of each system solution by Laetus combines the entire expert knowledge of Laetus. From the outset, POLYPHEM covers all control functions and can be configured in accordance with individual customer requirements without the need for additional programming effort. This drastically minimizes the time required to integrate the system and adapt it to new formats and control tasks. It also has a positive impact on system availability and total operating costs (TCO). Flexible, versatile, and scalable.

INSPECT's numerous options offer a wide range of applications. Specific control requirements can be implemented on various different packaging machines to suit your requirements. Regardless of whether it is for packaging lines for boxes, folded boxes, or blister

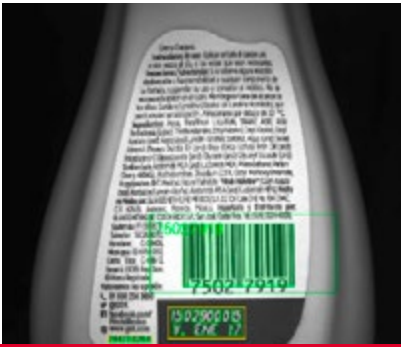
lines, defined quality criteria can be inspected just as they are on pouch packaging machines or labeling machines. See a selection of solution options and product applications on the following pages.

Not found a solution to fit your requirements? Contact us. The exact definition of the inspection tasks required are stated from the start. This allows you to trust in the extensive expertise of Laetus.



- 1 Identification using bar code/2D code
- 2 Presence monitoring
- 3 Identification using color rings
- 4 Tube orientation
- 5 Presence and color inspection
- 6 Inspection of print quality
- 7 Print inspection of plain text
- 8 Position
- 9 Blister control
- 10 Fill level control





1

Identification using bar code/2D code

1D and 2D codes are utilized in virtually all industrial sectors to identify products and to record data. The coding enables each individual product to be identified. In order to do this, the codes need to be read and inspected:

1D / 2D code

A reference code is programmed in and read. All codes being inspected are compared with this reference.

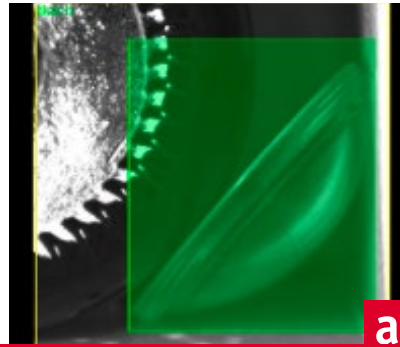
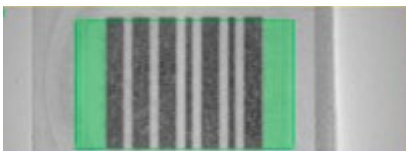
If the code is not exact, the system reports an error message, such as:

- No read (code not readable)
- Mismatch (error in code contents)

The position and orientation can also be evaluated.

Pharmacode reading

To identify the pharmacode, a reference code including quiet zone needs to be programmed in.



2

Presence monitoring

Crucial for the quality of product packaging is not only its intactness but also the completeness of its contents. There is a range of presence monitoring for this purpose:

a Presence of a dosing spoon

Thanks to the camera view from above into the open box, you can see in the search window whether a dosing spoon is present in the box. The spoon can be at a steep or flat angle.

b The presence of the enclosed brochure or information leaflet

For successful treatment, it is vital that the information belonging to the drug has been enclosed in the form of patient brochures or leaflets. This is guaranteed using presence monitoring.

Blue = search window

Yellow = object search frame

c Presence of the sealing ring

Is the sealing ring present and in the right position in the search window?

d Quality control for nasal spray

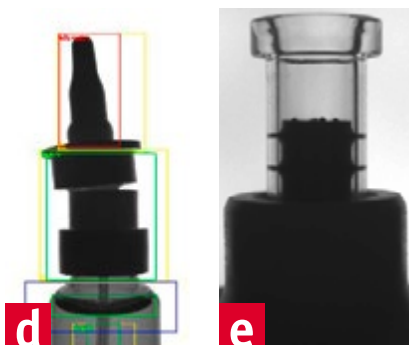
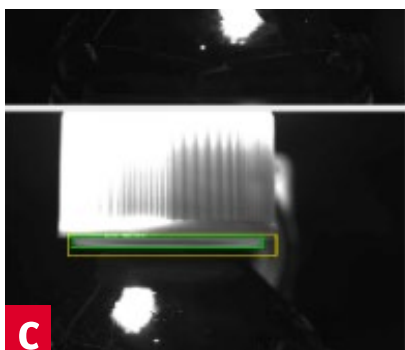
Checks the position of the tip and the presence of the canula in the bottle.

e Inspection of glass flask

The following criteria can be checked: Presence of the glass flask, the existence of the insert, the intactness of the insert, pattern matching, the integrity of the printing screen.

f Presence of ampules in the tray

For example, when illuminated from behind, the silhouettes of the ampules appear. A green frame shows presence, a red frame indicates absence. The checks are carried out as pattern matching against a learned reference.

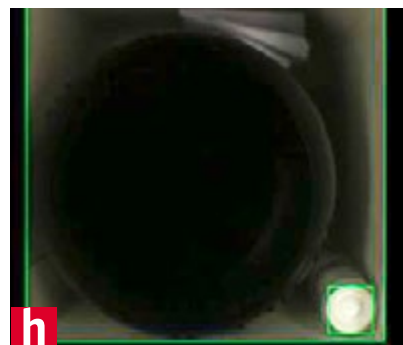


g Print control on the base of the bottle

The print control is carried out using a rotation tracker.

h Presence of pipette

The view from above into the carton shows whether the bottle (center), the information leaflet (above center) and the pipette (below right) are present.





3

Identification using color rings

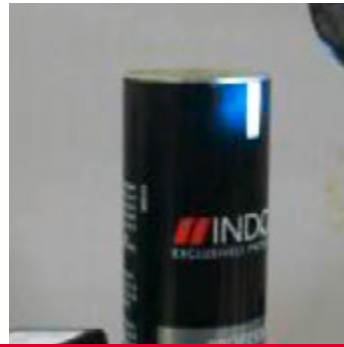
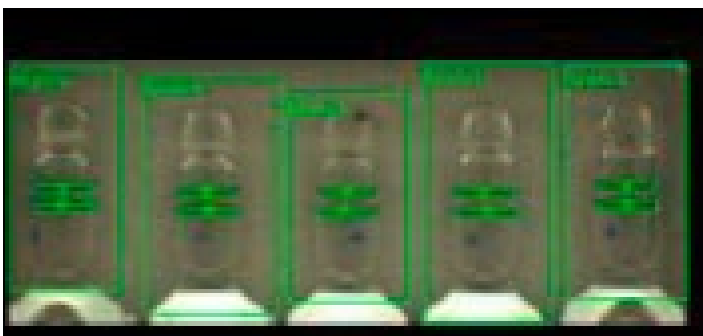
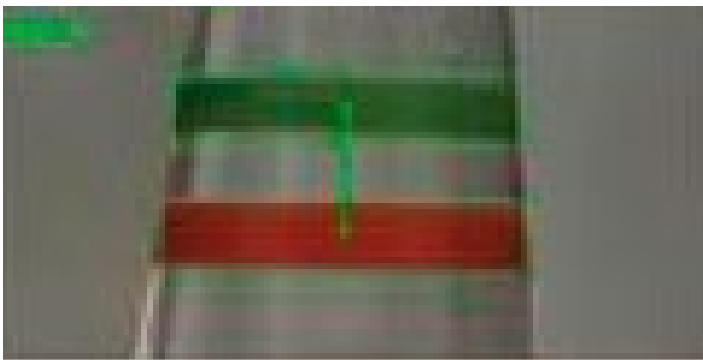
Color rings provide clear identification of glass ampules. In this example, ampules and vials are inspected in the same tray.

Inspection criteria of ampules:

- Number of color rings
- Color of ring
- Order of rings
- Width of rings
- Ring intervals
- Interruptions
- Length of total color ring code

Inspection criteria of vials:

- Presence of the cap
- Color of cap



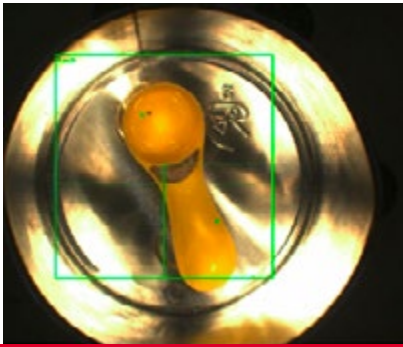
4

Tube orientation

Tubes must be oriented in the filling line before closure so that the seam can always be placed precisely. This allows the orientation to take place based on the print marks or the pharmacode.

The examples show a black tube with a white print mark and a tube which is orientated based on the pharmacode and the adjacent quiet zone.





5

Presence and color inspection

Color evaluation can check whether, for example, a dosing spoon is present but also whether the correct color has been enclosed. This application is also suitable for caps, information leaflets and canulas.



6

Inspection of print quality

Inspecting the print quality is an essential part of quality assurance for product packaging, regardless of whether it is for design elements or printed codes.

Based on given standards (e.g., ISO/IEC 15415 (2D code) or ISO/IEC 15416 (1D code)), evaluations are made of criteria such as:

- Contrast
- Defects
- Readability (codes)
- Modularity
- Straightness



Overall Symbol Grade	4.0	Grid Nonuniformity	4.0 14.6
Symbol Contrast	4.0 89.4	Fixed Pattern Damage	4.0
Decoding Grade	4.0	Modulation Grade	4.0
Unused ECC	4.0 100.0		
Axial Non Uniformity	4.0 1.3		

GS1 Status Wrong GS1 content



a

7

Print inspection of plain text

In addition to codes, packaging also includes numerous additional information in plain text, such as product or company information or logos, pictograms, and other symbols. Print inspection of this information is carried out using OCR/OCV reading.

a Inkjet printing on a PET bottle

b Base of a plastic cosmetic container.

The print inspection is carried out using a rotation tracker. The print can therefore be inspected in any desired position, and even upside down.

c OCV = A string reader checks the presence and reference of the plain text characters according to the „show and go“ principle

OCR - Font based reading = All characters are read in, decoded and compared with learned-in characters to check whether the information is correct. This also interprets the fonts being used.

d Print controls on tubes

After filling the tube, the date is lasered onto the tube seam and then inspected.

OCR = with reference data in the window

OCV = show and go

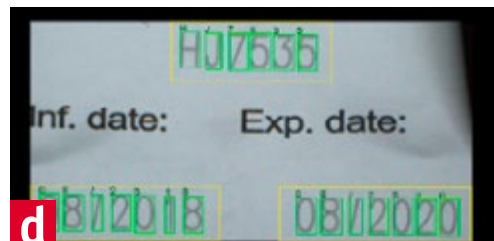
e Label print



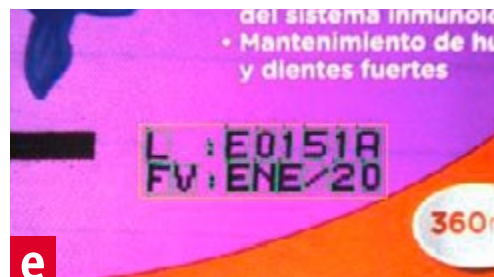
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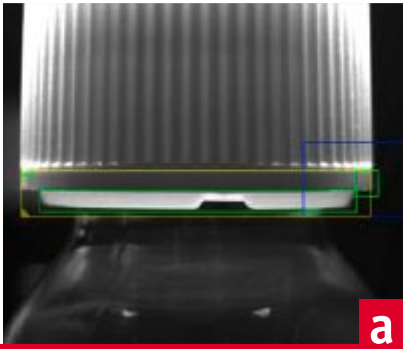
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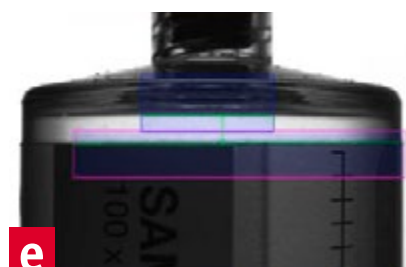
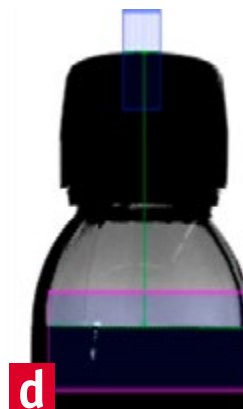


8

Position

Controlling the right position of packaging components and labels is an important part of quality control. Numerous criteria can be inspected such as:

- a** Correct positioning of the sealing ring
This checks whether the seal is in place and the lid has been put on straight. On the right-hand edge of the sealing ring, there is a tracker field which provides a reference for finding the control field.
- b** Quality control for nasal spray
Checks the position of the tip and the presence of the canula in the bottle.
- c** Label on the adhesion tape roll:
In this example, checks are made of the presence and correct positioning of the label, and also whether it is the correct label (size, type,...)
- d** Placement of label on the bottle
The distance between the upper edge of the cap and the upper edge of the label is measured to check the correct position of the label.
- e** Label control with background lighting
In order to achieve better contrast, the correct placement of the label is checked on two levels using background lighting.



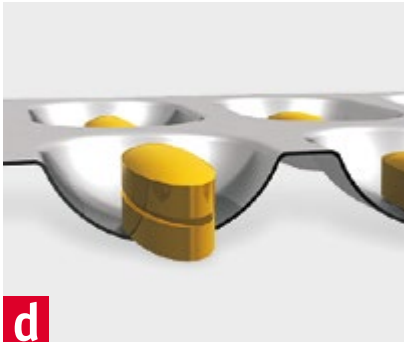


9

Blister control

Increasing quality and safety requirements mean it is necessary to check for further criteria in addition to simply the presence inspection. Irregularities can occur when filling pharmaceuticals in blisters, which can have relevant impacts on the quality:

- a** Presence
Lack of contents are unacceptable from a quality point of view and are immediately identified.
- b** Orientation
This, for example, checks for products for which the orientation are a quality characteristic (e.g., bicolored capsules).
- c** Damage/position error
Damaged products are ejected after clear identification. Objects outside of the blister are also identified. These must be removed before sealing.
- d** Height evaluation
POLYPHEM 3D reliably identifies double tablets which are lying directly on top of one another. The error is not visible under normal conditions and is only detected from a height. Even the most minimal defects are detected.
- e** Height evaluation
Tablets which are broken horizontally on the underside appear intact from above. The error is picked up by the lower height.
- f** Soiling
Even the smallest amount of soiling is detected using the blister control or POLYPHEM.
- g** Measurement
The measurement detects whether, e.g., capsules have been compressed or are too long, which ultimately leads to damaged or incorrect fill quantities.
- h** Color
Incorrect colors are detected in monochrome products. The system detects each color or the combination for multi-colored products.
- i** Overfilling
Double contents can lead to overdoses and must be removed from the process.
- j** Foreign object/color mix-up
Unwanted mix-ups with foreign products are unacceptable for quality and product safety-related reasons.
- k** Shape control
Shape control reliably detects deformed products.
- l** Low-contrast environment
In difficult, low-contrast environments, absence, damage, and color errors are reliably detected.



d



e



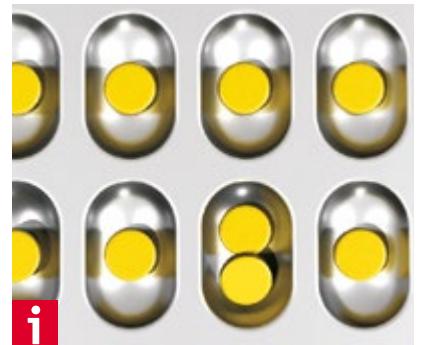
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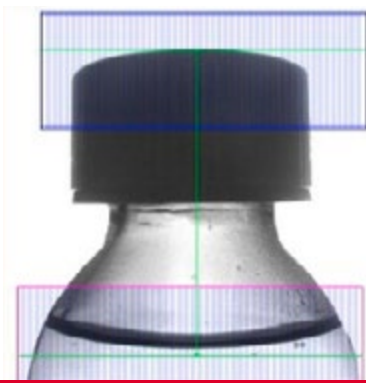
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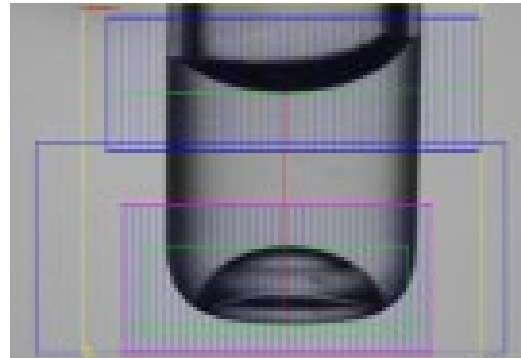


10

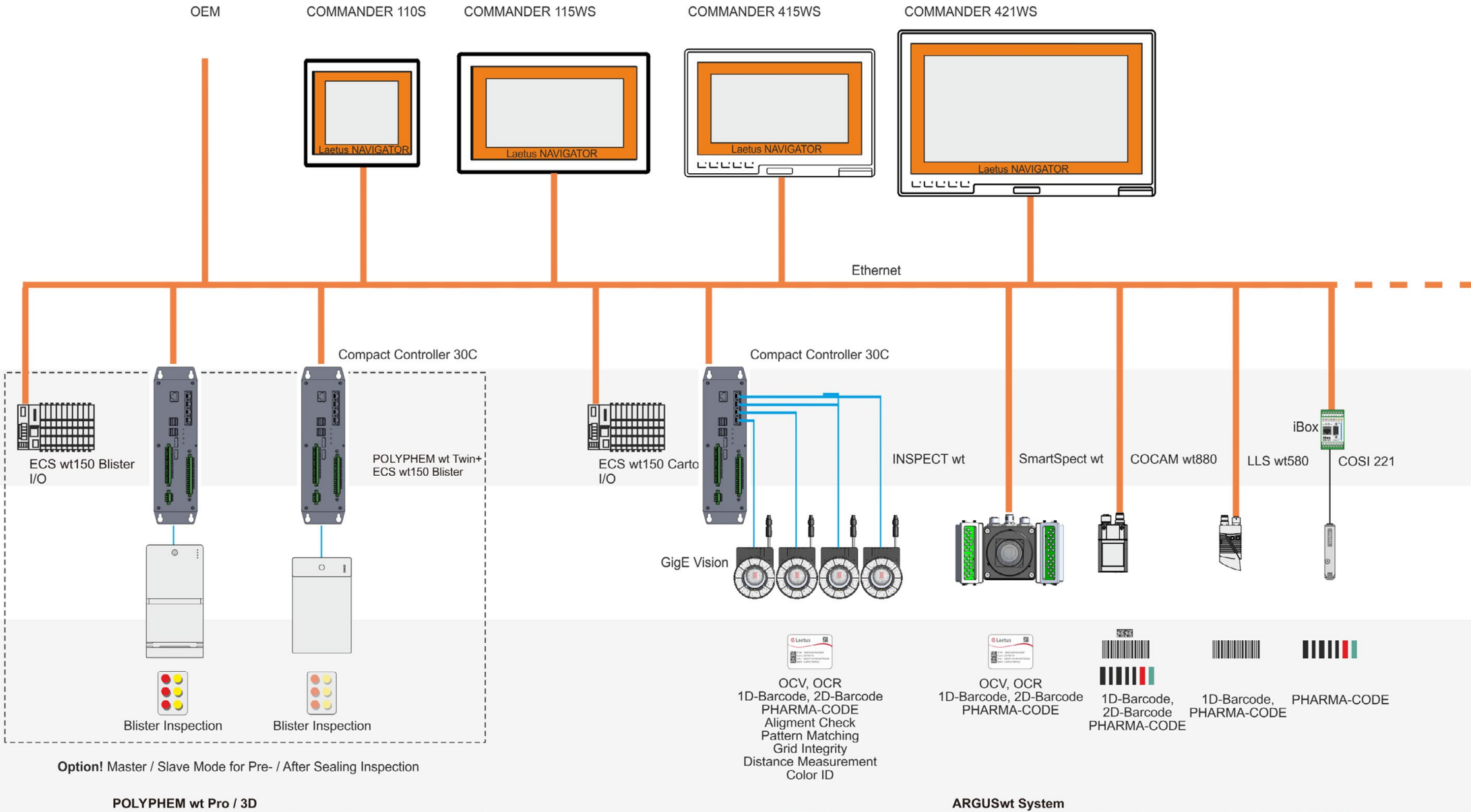
Fill level control

Controlling the correct fill level is an important quality criterion. In the pharmaceutical and food industries in particular, the fill level control provides reliable packaging processes.

In the example, the distance between the upper edge of the lid and the fill level is measured in order to check the fill level. Background illumination is used to find the edges.



ARCHITECTURE ARGUSwt SYSTEM





1 | 2 | 3 | 5 | 6 | 7 | 8 | 10

1 | 4

SmartSpect

SmartSpect is the next generation of fully-integrated smart cameras for optical quality control. The intelligent camera system combines camera and high-performance image processing into a single housing. The CMOS sensors used deliver images in high resolution even at high conveyor speeds. The Intel Dual Core embedded processor quickly handles the image data it has obtained and makes an additional PC or controller superfluous. The pre-configured variations have a short delivery time and, due to their compact design, are easy to install even in tight spaces. SmartSpect offers a wide range of application modules for comprehensive automatic product identifications:

Highlights

- Fast, precise, and consistent reading of all common one and two dimensional bar codes, including inspection of their print quality
- High reliability for plain text recognition and reading of various fonts, regardless of the background design
- Flexible combination of application modules for complex requirements
- Monitored operator access to the system parameters enables simple system adjustments
- Software to trace the application allows for the adjustment of the camera inspection area to various positions and orientations of the object

COSI 221

The world's most commonly used sensor for the inspection of color PHARMACODE™ also checks inverse codes, print marks, and supports the orientation of the tube.

The compact design means that the COSI 221 can also be installed into very limited spaces.

Highlights

- Checks PHARMACODE (monochrome/multi-colored), tube orientation, print mark, inverse code
- Code reading on boxes, information leaflets, and tubes
- Highly compact design: can even be installed in tight spaces
- Exceptional color sensitivity
- Integrated evaluation of signal data: Fault-free and reliable inspection

**1**

LLS wt580

The versatile scanner impresses with its advanced decoding technology. Incomplete or partly damaged codes can be read reliably. High efficiency with a scan frequency of up to 1200Hz enables speeds of up to 6 m/sec.

LLS wt580 reads all known bar codes including the PHARMACODE and code 32. The compact design enables installation even in extremely tight spaces.

In conjunction with the ARGUS family and other Laetus sensors, the LLS wt580 offers a very efficient application in packaging control.

Highlights

- Can read all known bar codes incl. PHARMACODE
- Suitable for all surfaces (from paper to film)
- Code reading when moving or still
- Easy handling
- Integrated web technology interface

**1****6**

COCAM wt880

The cost-effective and compact camera has been specially constructed to reliably read all known codes on packaging. The COCAM is excellent for high speed use. It reads, controls, and verifies all common labels, stacked codes and bar codes in real time.

Its integration into the technical network of the Laetus solutions makes the COCAM wt880 perfectly suited to automated processes. It is easy to operate and stands out thanks to its automatic focusing, live images, and settings assistant. These functions means that learning-in times, maintenance, and training costs are very low.

Highlights

- Code camera with WVGA sensor
- Industrial design with compact make-up
- Reads all common 1D and 2D bar codes including PHARMACODE
- Can be implemented for all applications and marking processes
- Code reading when still or when moving up to 3 m/sec
- Automatic focus setting
- Bar code quality assessment based on ISO/IEC 15415 and ISO/IEC 15416
- Orientation help (Laser)



1 | 2 | 3 | 5 | 6 | 7 | 8 | 10

INSPECT wt

The versatile Laetus INSPECT wt camera system offers a wide range of software application modules. Thanks to its unique flexibility, the web-based camera system can be used for the widest range of control requirements in the packaging process.

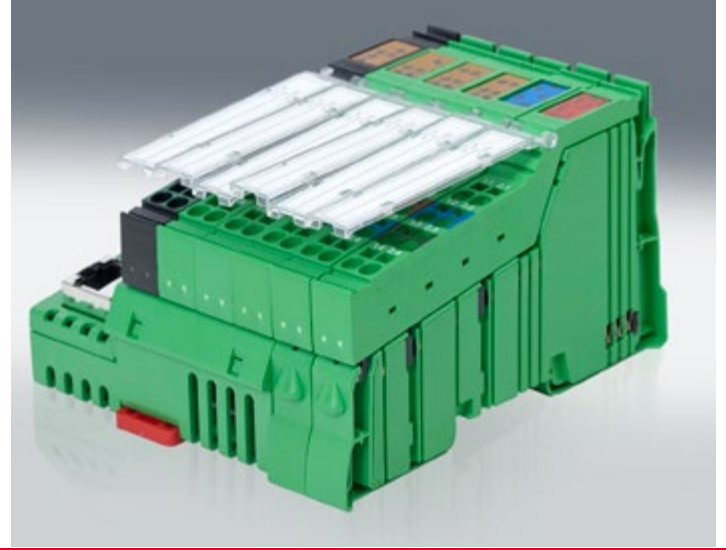
The modular setup means that INSPECT wt is the product of choice for all important inspection areas, since it guarantees quality and safety of packaging as well as efficiency.

INSPECT wt is equipped with various application modules which enable a range of automatic and 100% quality controls.

Highlights

- Wide range of pattern and object integrity inspections
- Orientation control, e. g. the position of labels
- Color-based applications such as identification of color rings on ampules or the flip-off integrity of vials
- Various presence controls

- Fast, precise, and consistent reading of all common one and two dimensional bar codes, including the inspection of their print quality in accordance with ISO/IEC 15415/15416 and ISO/IEC TR 29158
- High reliability for plain text recognition and reading of the widest range of fonts, regardless of the background design
- Flexible combination of application modules even for complex requirements
- Monitored operator access on the system parameters enables easy adjustment of the system
- Application tracking software for adjusting the camera inspection surface to various positions and orientations of the object



2 | 5 | 9

POLYPHEM wt

The exceptional camera system for filling control on blister machines stands out due to its extensive range of control options. This detects a very wide range of product materials, and their possible errors, and reliably ejects them from the production process.

Colored tablets, capsules of various consistencies and contents (firm, loose, or liquid), smooth and rough surfaces: no matter how diverse the inspection requirements may be, POLYPHEM wt has been outstanding at mastering them for many years and in thousands of machines.

Inspecting various products

- Tablets
- Capsules and pills

Erkennung unterschiedlicher Fehler

- Color, shape, size
- Soiling, damage, foreign object
- Placement fault, presence, overfilling
- Height (3D)
- Contour (3D)

ECS wt

The ECS wt150-10 (Eject control system) is an eject control system designed according to special requirements of a packaging machine and, together with ARGUS wt10, provides the level of safety required in the pharmaceutical packaging industry.

Good or bad information from ARGUS wt or connected code readers to a product are tracked by the ECS wt150-10 in synchronization with the product movement. All products identified as bad are ejected.

Typical applications for the ECS wt150-10

- Cartoning machines
- Tube filling machines
- Seaming machines
- Labeling machines



ARGUS wt

The ARGUS wt system is a modular network-supported control system for reliable code and print control in the packaging process.

The coding of products is the simplest and most efficient form of control.

An intelligent server controls the data management and access control for all connected wt devices. Each control point in the packaging line is operated centrally via the NAVIGATOR. The modern browser is perfectly suited to all touch-screen applications.

Additional reliability is guaranteed by the integrated eject control system ECS wt150, which ejects each product which is not clearly identified as “good” out of the packaging process.

Device-independent product database

- Shared for all connected wt devices
- Convenient defining, loading and saving of product data
- Simple settings for each product or configuration assistant
- Easy to understand and quick change of format
- Clear line or machine-specific set up of control points

User administration

- Function and personal password protection

Device administration

- Freely selectable number of devices to connect for code reading, print control and other control tasks
- All functions of the connected wt control points remain available to their full extent
- Update service, option of remote maintenance

Audit Trail

- Support for requirements from 21 CFR Part 11



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Why Laetus

- Over 40 years of experience in optical quality control ensures reliable solutions
- Track & Trace expert supporting small, medium and global companies
- Flexibility in integrating solutions due to a modular approach
- 24/7 hotline
- Worldwide technical service
- Project management from initial consultation to final implementation
- Quality management through validation
- Training academy with a multitude of individual training courses



Solution Partner
Laetus GmbH