



Making the Switch to 2D to Meet New GS1 Standards?

Key Considerations for Success



Agenda

- What's Driving the Shift to 2D for GS1?
- Conversion to the New GS1 2D Standard
- Key Considerations for 2D Conversion
- Automating Traceability and Quality Control Processes
- AI-Based Machine Vision and Barcode Readers
- Example Applications
- Why Cognex?
- Q&A





Isabel Pagliaccio

Manager, Product Management

Isabel joined the Cognex Product Management team in 2019. She has contributed to various departments and product lines, including 2D Vision, 3D Vision, and ID products. Currently, she is a part of the ID Products Business Unit, where she manages the mid-range ID fixed-mount products and spearheads new fixed-mount product development. Isabel holds a bachelor's degree in mechanical engineering from Worcester Polytechnic Institute (WPI) and a Master of Business Administration from the Isenberg School of Management.



What does Cognex do?

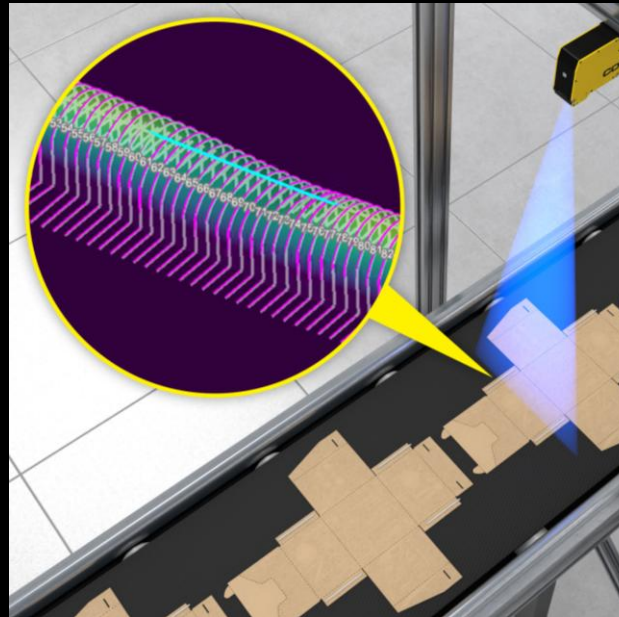
Guide



Identify



Gauge



Inspect



What's Driving the Shift to 2D for GS1?



Compliance

- ISO/GS1
- Supply chain partners

“Over 10 billion GS1 codes are scanned daily and are a cornerstone of global commerce”.¹



Consumer insight

- Consumers desire more product information to make informed purchases

“79% of shoppers are more likely to purchase products with a QR code that offers the information they are looking for”.²



Traceability

- Recall mitigation & supply chain transparency

“Consumers demand more information about the products they’re purchasing ...and there’s an ongoing need to track and trace products more effectively through the supply chain. We can resolve this with 2D barcodes with GS1 standards inside...”³



1, 2 – GS1 US Consumer Survey: How Product Data Influences Shoppers, Accessed Jan 6, 2025

3 - Letter to CGF Board of Directors by Jon R. Moeller, Chairman of the Board, President and Chief Executive Officer, Proctor and Gamble, October 23, 2023

Conversion to GS1 2D Standard

- Linear (UPC/EAN) to 2D (QR, DataMatrix) ➔ **Phasing out legacy systems, supply chain coordination, significant investment**
- Increased code density
- Consumer engagement



Dual-marking transition phase
EAN/UPC **and** a 2D barcode



GS1 2D Sunrise 2027:

- Transition from 1D barcodes to 2D barcodes at point-of-sale (POS) and point-of-care (POC) by 2027

Reduce

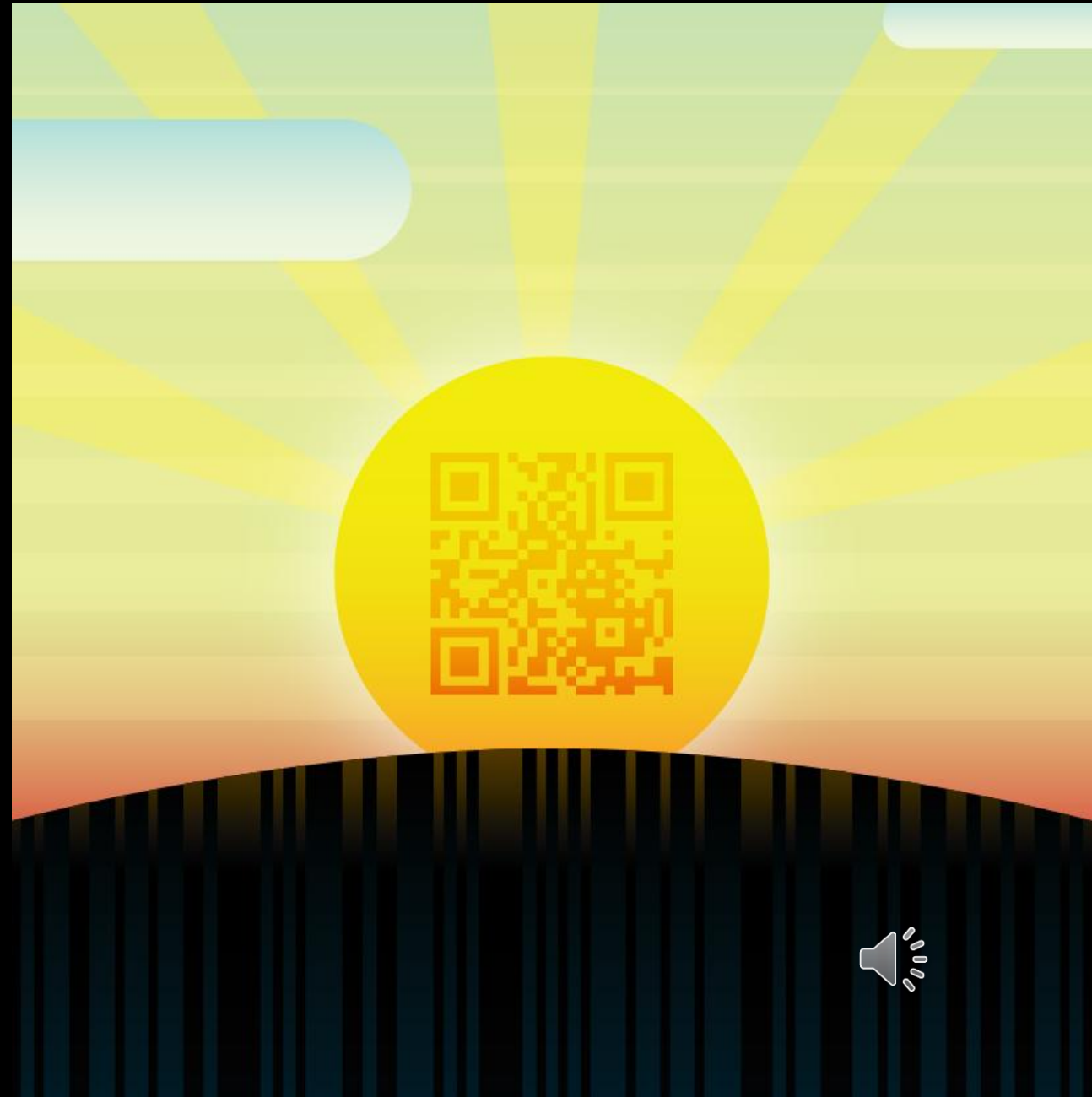
- Recall risk
- Disconnects between brand and customer
- Operational pain during the transition period

Improve

- Supply chain information
- Traceability
- Customer engagement
- Global trade compliance
- Brand trust



Three Key Considerations for GS1 2D Conversion



1 What Are Your Coding Choices?



Current 1D UPC Codes

- No changes required



2D Barcode with the Current GTIN

- Smaller, sleeker space on packaging



GS1 QR or DataMatrix Syntax

- Include lot numbers, expiration dates, and serial numbers



GS1 Digital Link Format

- Unified 2D Barcode
- Consumer Interaction
- Comprehensive Access (Supply chain partners)



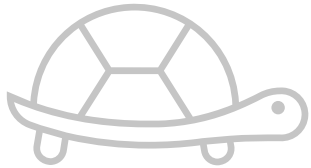
2 Impact of GS1 2D on Package Coding



- **Current Printing Practices**
 - UPCs are often pre-printed as part of package graphics
- **Changes with 2D Barcodes**
 - Inclusion of variable data like lot codes, expiration dates, and serial numbers
 - Barcodes need to be **printed** during packaging
- **Leverage Existing Packaging Line Equipment**
 - Most lines have equipment for printing text formats
 - Need to address printing 2D barcodes within the packaging line

3

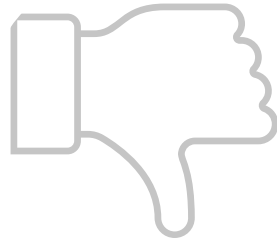
Operational In-line Code Printing Challenges



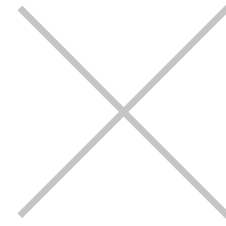
Slowing line
throughput while
conducting new
verification and
quality steps



Excessive
chargebacks
from supply
chain partners
due to non-
compliant codes



Inconsistent print
quality due to
evolving
packaging types
and materials



Misreads and no-
reads of 2D and
text codes slow
down throughput
and add cost and
time



Deployment of
new quality steps
may be
perceived as
complex and
time-consuming



Automating Traceability and Quality Control Processes



Automation Opportunities in the Code Printing Process

Reduce Recalls, Improve Traceability, Increase Compliance, and Foster Customer Trust



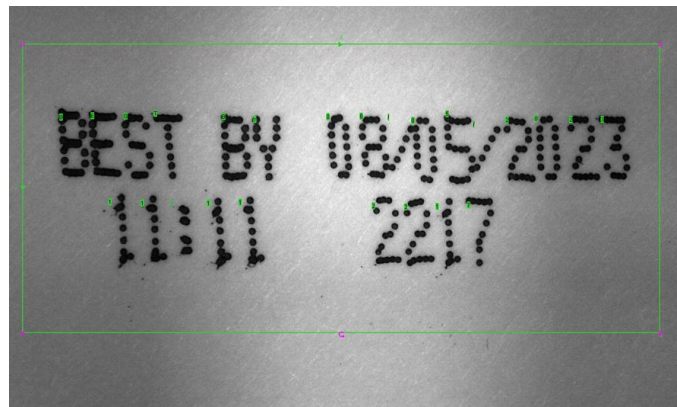
Decoding Barcodes

Double-check that encoded data matches expectations



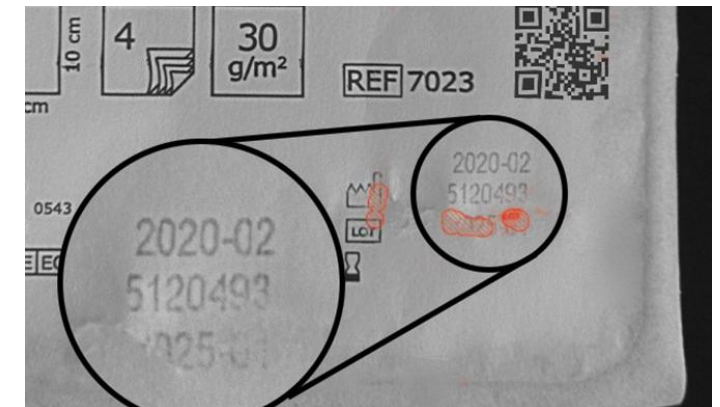
Code Quality Inspection

Ensure barcode quality meets supply chain standards



Text Code Verification

Thoroughly read and verify printed text codes using OCR technology



Print Quality Inspection

Check barcodes, text codes, and symbols for correct alignment and position, and consistent print density

Related Inspection Applications

Reduce Recalls, Improve Traceability, Increase Compliance, and Foster Customer Trust



Label Inspection

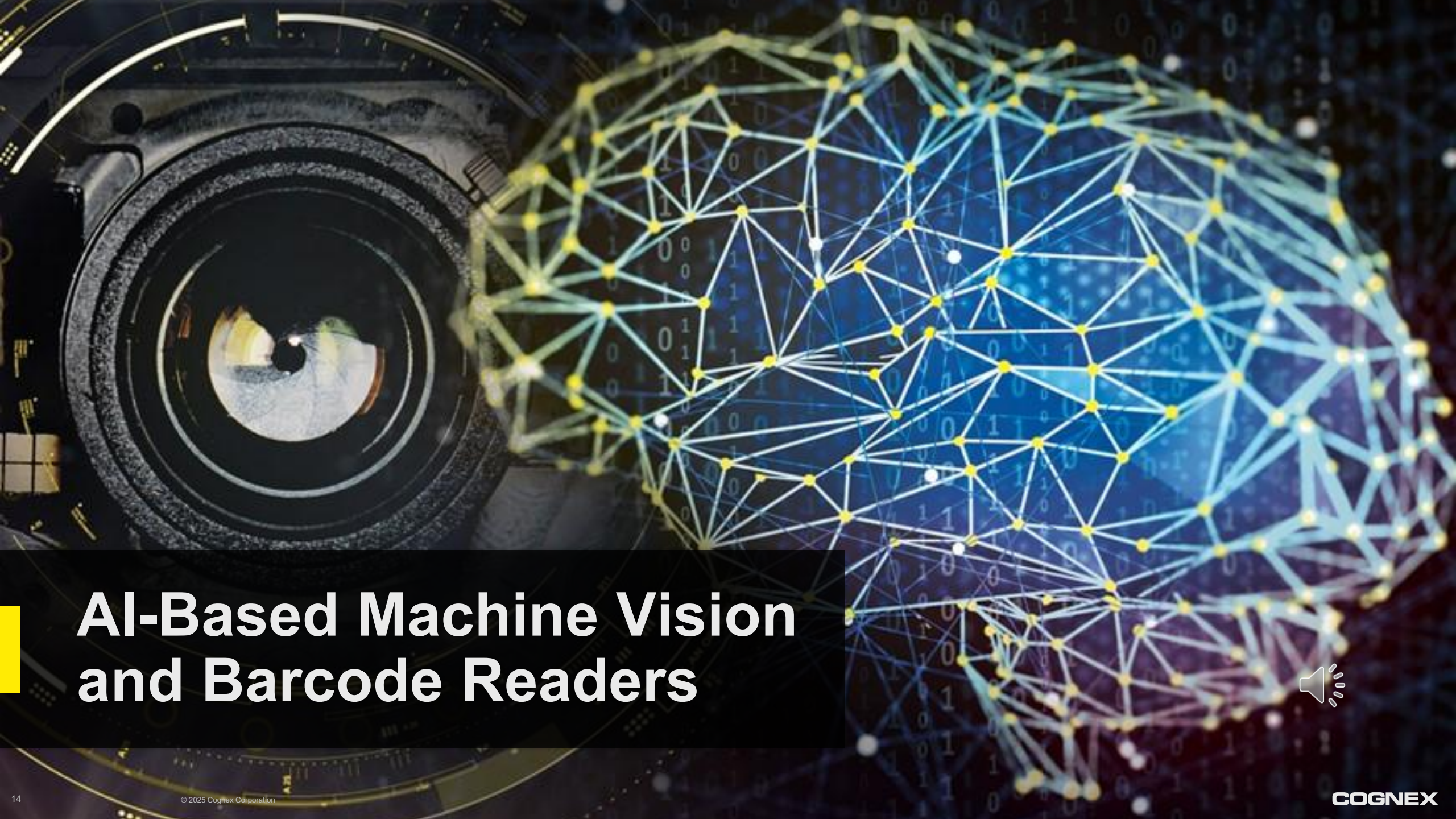
Ensure labels contain the required information and are of good quality



Packaging Inspection

Check for packaging defects that may compromise the quality of the product



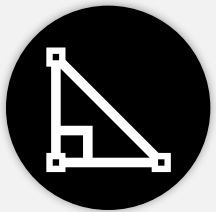


AI-Based Machine Vision and Barcode Readers



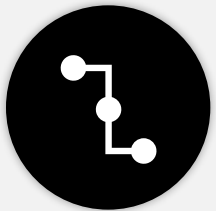
Traditional Machine Vision

Rule-based: Good for long-running inspections without frequent changeovers



Precise

Required for exact measurements and precise location and fixturing



Predictable

Works well within similar classes and specific tolerances



Ideal for:

Robotic guidance, measurements, text and barcode reading

Next-Gen Machine Vision

Example-based (AI): Good for systems with inherited variability (frequent changeovers or challenging packaging types/materials)



Minimal Training

Teach pass/fail based on labeling of good and bad parts or codes



Tolerates high variability

Works well even with significant variation within the same class



Ideal for:

Cosmetic inspection, classification, assembly verification, complex text, and challenging barcode reading



AI-Powered Vision Systems and Barcode Readers

- **Reliable, flexible performance:**
Inspect every part, read every code
- **Easy to set up and use:**
Unbox and run application in minutes
- **Dedicated support:**
Optimize performance with end-to-end support



High-Speed Barcode Reading

Task

Read barcodes on Fast-Moving Consumer Goods (FMCG) products on high-speed manufacturing lines to verify that encoded data is as expected.

Featured Technology

DataMan Fixed-mount Barcode Readers

Benefits

- Reduces costs associated with label rework
- Improves traceability for serialization
- Facilitates potential recalls



Case/Carton Mark and Read

Task

Read contents of printed 2D barcodes on cartons and case products to ensure codes are properly printed and contain the correct data.

Featured Technology

DataMan Fixed-mount Barcode Readers

Benefits

- Improves traceability for supply chain partners
- Facilitates potential recalls
- Detects coding errors in real-time and rejects non-readable codes



Simultaneously Decode and Verify 2D Barcodes and Text-based Lot Codes

Task

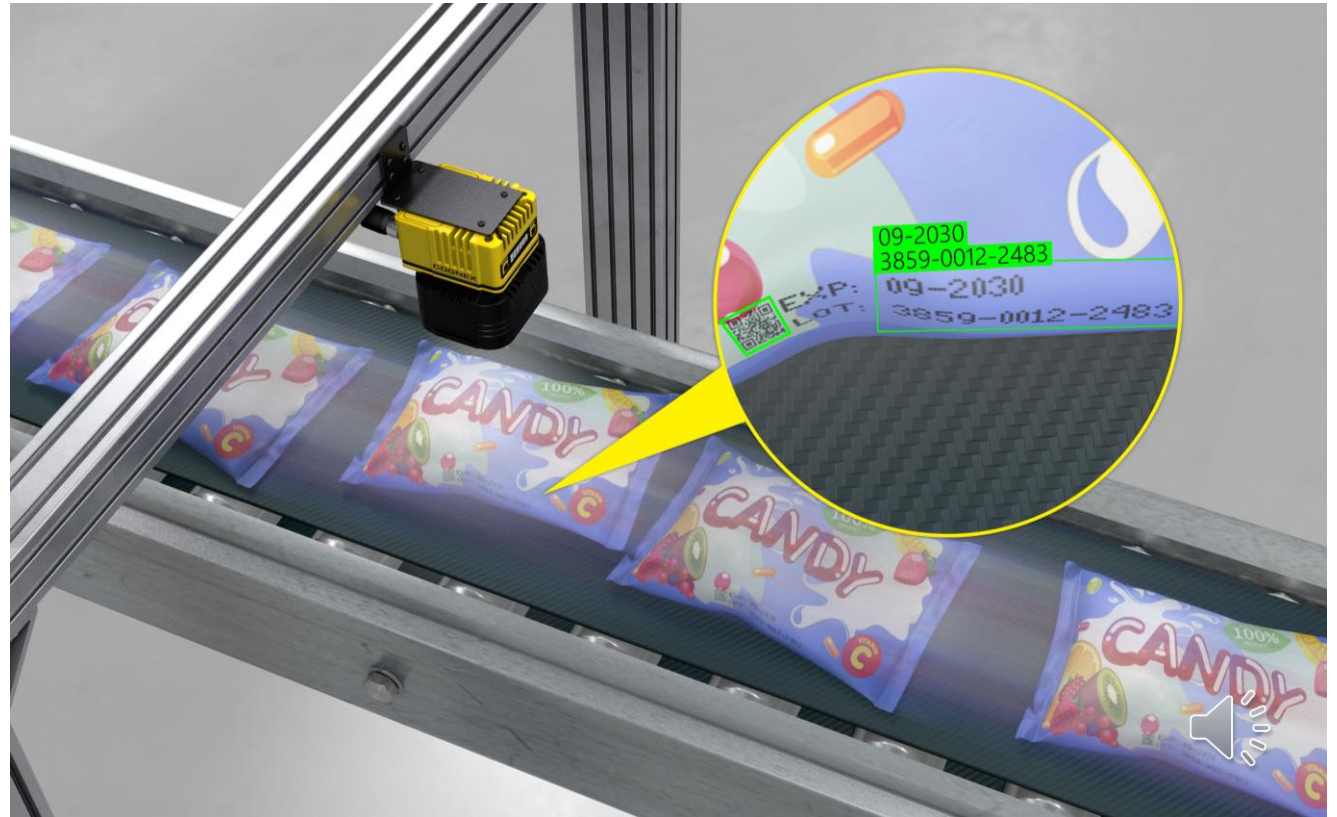
Decode the printed 2D barcode and verify the text-based printed lot code matches what is expected within the same process step.

Featured Technology

In-Sight Vision Systems

Benefits

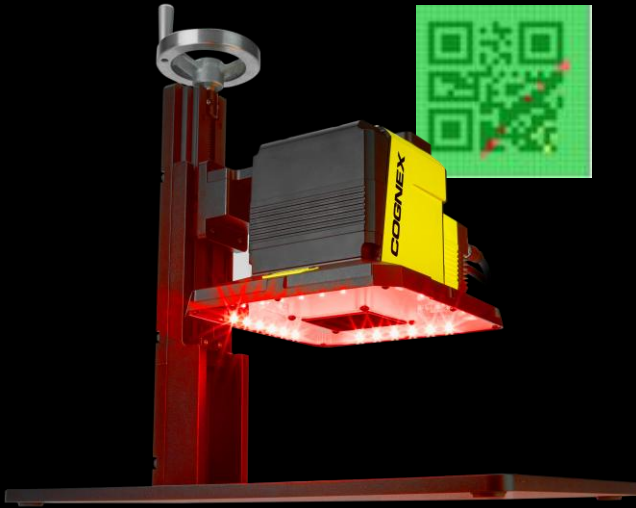
- Shorter line downtime
- Recall avoidance
- Protect brand reputation
- Regulatory compliance



Cognex Solutions for GS1 2D Code Quality Inspection

DataMan 475VS Series

Offline verifier grades 1D, 2D, and DPM codes with adjustable height stand accessory



DataMan 290 Series

Compact AI-powered barcode reader with barcode grading capabilities



DataMan 370 Series

Flexible and powerful barcode reader with full Standard Based Grading algorithms



In-Sight 7905V

Versatile inline verifier, with offline capability verifies barcode quality and runs visual inspections



Barcode Verification

Task

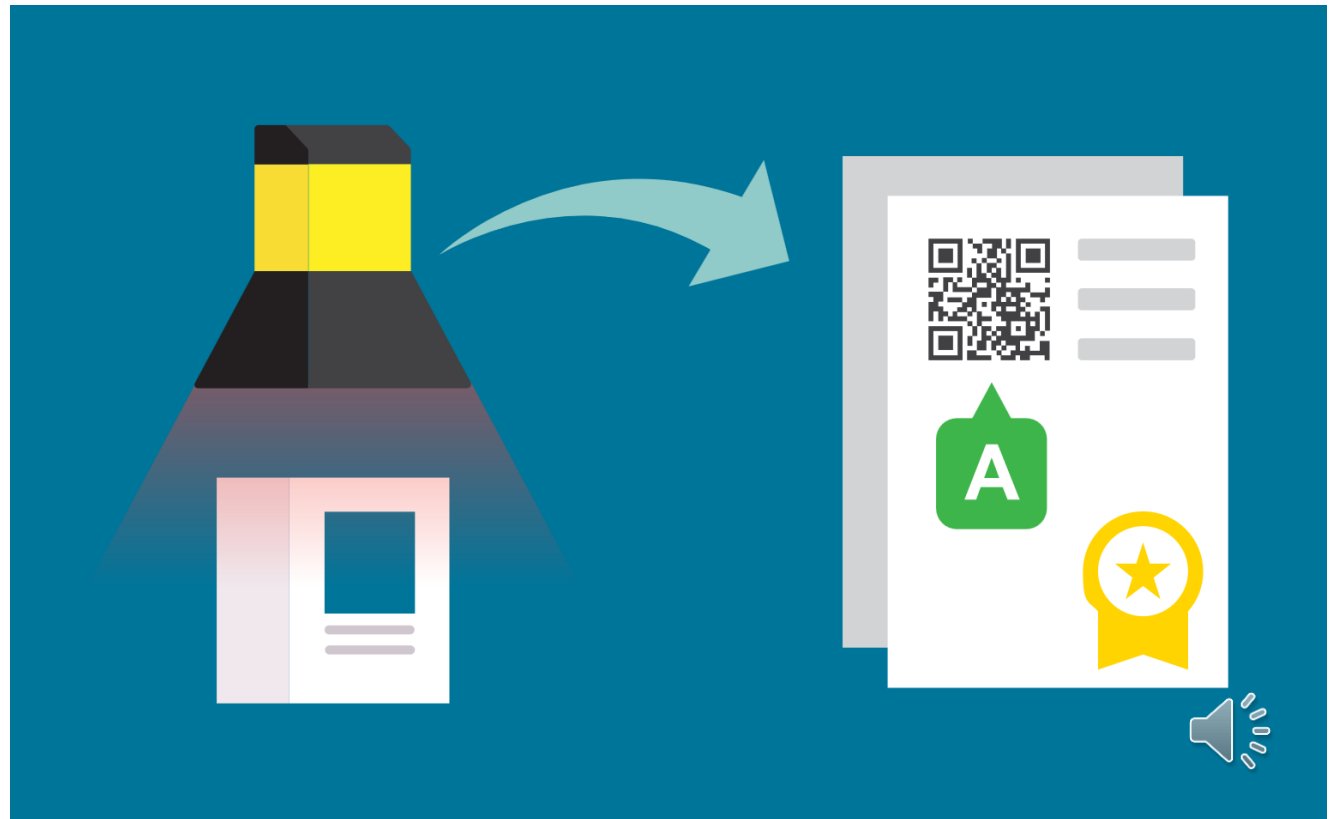
Verify the first and last barcodes in the lot against ISO standards to ensure the codes can be reliably read and decoded all along the supply chain with any device.

Featured Technology

Cognex Barcode Verifiers

Benefits

- Reduces supply chain partner chargebacks
- Avoids loss of future business by retailer
- Eliminates product recalls due to unreadable barcode



Inline Barcode Quality Grading

Task

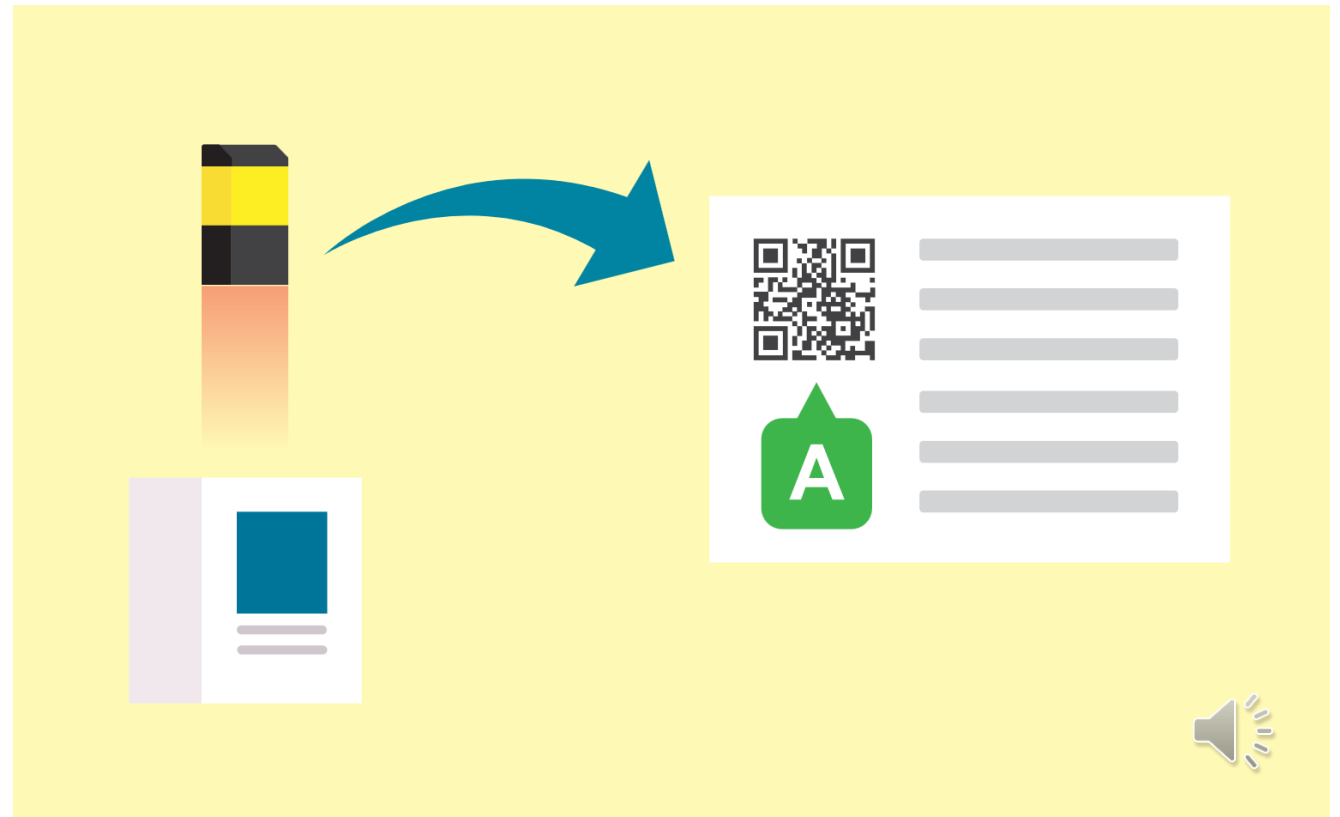
Evaluate each barcode in the line against ISO grading parameters, such as decodability, format, symbol contrast, and modulation, to ensure the codes can be reliably read and decoded with any device throughout the supply chain.

Featured Technology

DataMan Barcode Readers

Benefits

- Reduces supply chain partner chargebacks
- Avoids loss of future business by retailer
- Eliminates product recalls due to unreadable barcodes



Multi-Code Proximity

Task

If both 1D and 2D codes are used, it's important to confirm that they are the proper distance from each other to maintain their “quiet zones” and ensure readability by the retail scanner.

Featured Technology

In-Sight Vision Systems

Benefits

- Ensures adherence to code regulations
- Prevents potential business losses from retailers
- Avoids product recalls due to illegible barcodes



Print Quality Inspection

Task

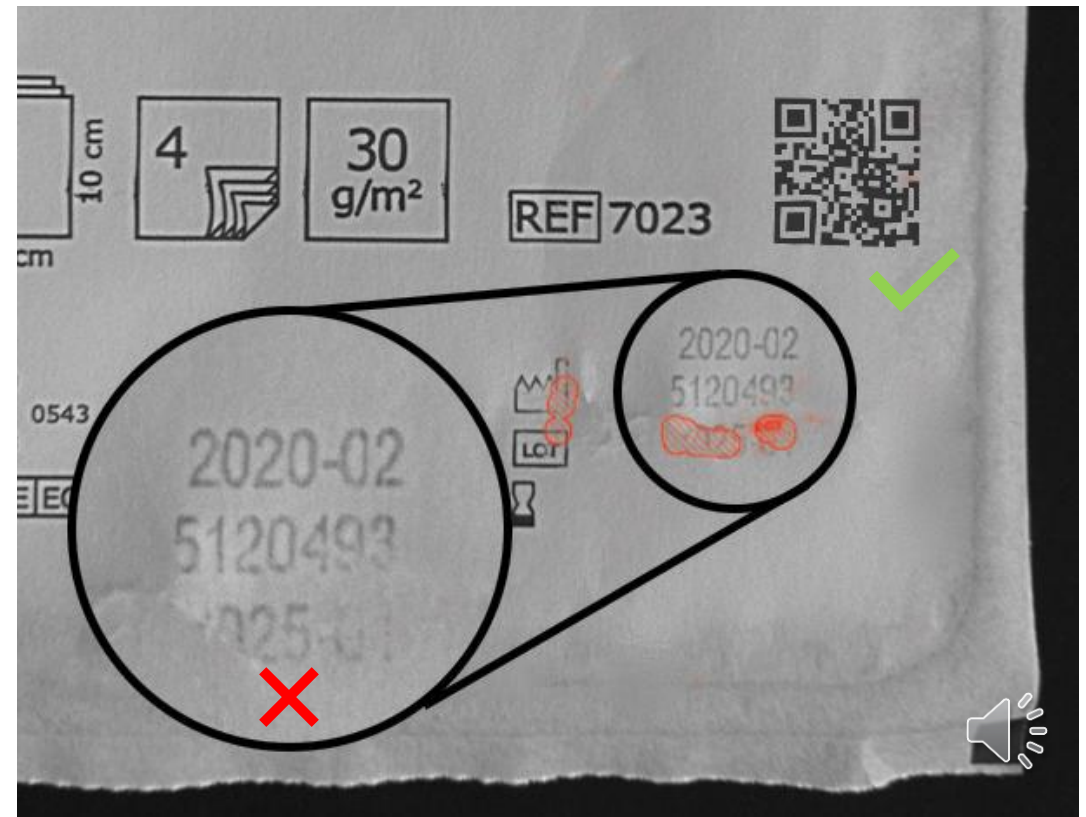
Check the quality of all content printed by the inline printer, including 1D & 2D barcodes, text codes, and any lot-specific symbols

Featured Technology

In-Sight Vision Systems

Benefits

- Reduces recalls due to printing errors
- Improves brand trust
- Meets regulatory compliance



Label Inspection

Task

Check for the presence or absence of allergen labels and ensure they are clearly printed.

Featured Technology

In-Sight Vision Systems

Benefits

- Complies with legal regulations
- Decreases the chance of label-related recalls
- Strengthens consumer trust & brand credibility
- Increases production throughput



Packaging Inspection

Task

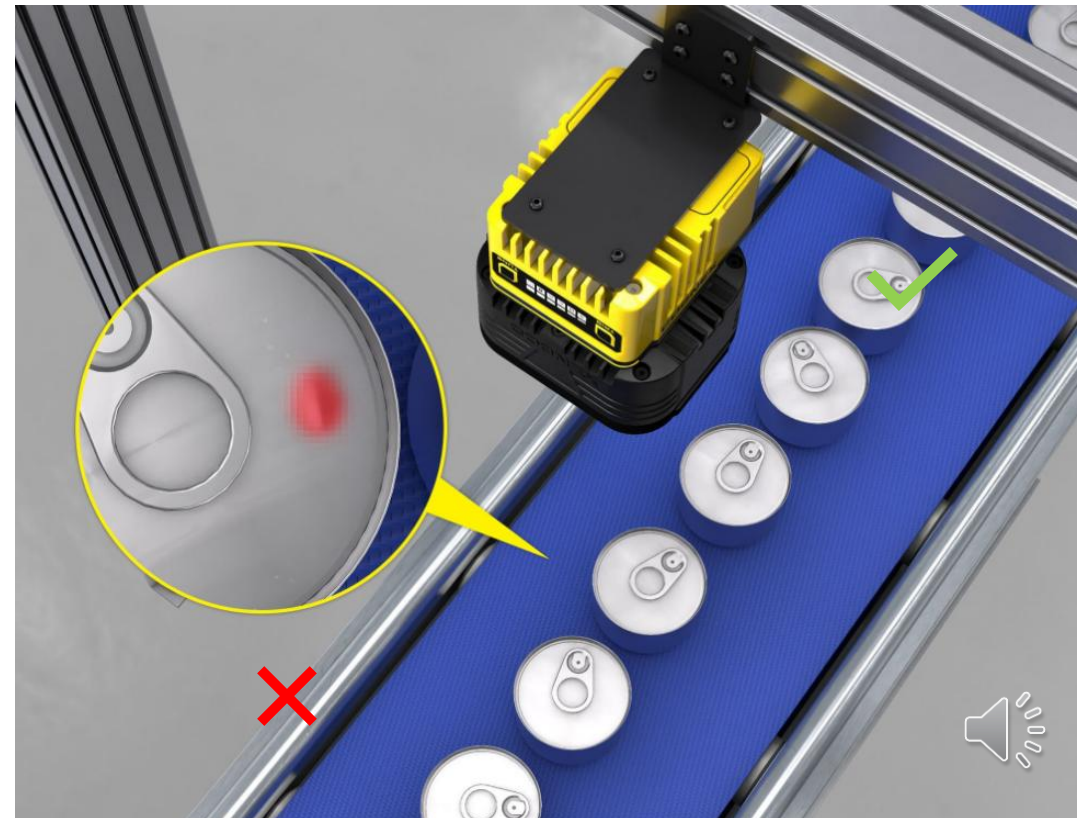
Check the lids of beverage cans for defects, such as scratches, dents, or damaged tabs

Featured Technology

In-Sight Vision Systems

Benefits

- Reduces recalls due to packaging quality
- Improves brand trust
- Increases production efficiency



Enhance Packaging Quality and Traceability with Cognex Application Expertise

PRODUCT QUALITY INSPECTION



Check for debris, verify shape/size, check completeness, and ensure consistent product color.

PACKAGING INSPECTION



Check for torn or missing labels, verify date code presence, detect damaged products, ensure label print integrity, and verify safety seal presence.

ASSEMBLY VERIFICATION



Detect missing items, check fill level, enhance palletizing, and guide robotic picking and placement.

TRACEABILITY & REGULATION COMPLIANCE



Achieve traceability, verify product match, check correct allergen labels, unique country regulations, and reduce counterfeiting.

WAREHOUSING & DISTRIBUTION



Improve intra-logistics tasks such as pallet reading, auto sorting, and multi-code barcode reading.



Why choose Cognex?

1-2-3

Easy and flexible

Intuitive products that can be set-up, maintained, and tuned by line staff



Highest performance

Solve simple to advanced applications at unmatched rates, and at production speed



Reliable and dependable

Self-service tools and a global network of support ensure our customers' success

“The Cognex edge learning-based vision systems **make our best even better.**”

Jerry Bilse, Senior Vice President of Operations,
Federal Package

“DataMan readers significantly improved the efficiency of our packaging lines. The image-based ID readers provide **near-perfect read rates.**”

- Dave Fortin, Technician, Kraft Foods Canada

“With the help of Cognex DataMan barcode readers, customers can **fully utilize encoding information within GS1 2D codes** to create more efficiency and help them improve traceability.”

Zhang Yonghong, Chairman and CEO,
PanPass Technology





The global leader in industrial machine vision and barcode reading

>40 years
in business

\$830M+
2023 revenue

>60%
revenue from EU & Asia

17%
of revenue into R&D

>1,100
technology patents

>8 years
developing AI for industrial
machine vision

>25K
global customers

400+
channel partners

500+
global customer support resources



Thank you - Q&A



Thank you - Q&A



Thank you - Q&A



Thank you - Q&A

