OMRON

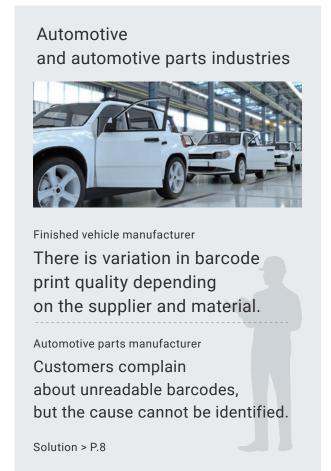# Print quality verification to ISO guarantees readability of barcodes

Today, unreadable barcodes can result in damaging the credibility of products and companies

Traceability is being applied throughout supply chains for product quality control, counterfeit prevention, recall avoidance, and highly efficient logistics. While 1D and 2D codes play a key role in traceability, manufacturers and distributors face the challenge of barcode quality management.

Is your industry facing the challenges of barcode quality control?

Prescription medication and medical device industries

Barcode verifiers must be installed within the time specified by law or regulation, with as little effort as possible.

Automotive and automotive parts industries

Finished vehicle manufacturer
There is variation in barcode print quality depending on the supplier and material.

Automotive parts manufacturer
Customers complain about unreadable barcodes, but the cause cannot be identified.

Omron's barcode verification systems provide objective barcode quality verification, preventing unreadable barcodes from escaping

Food and digital parts industries

Retailers make a complaint that barcodes used for authenticity assessment cannot be read.

Logistics and e-commerce

Unreadable barcodes on product management labels require time-consuming confirmation and manual entry of information.

Verification to international quality standards

Both hardware and software verify barcodes against ISO standards, enabling reliable quality evaluation.

Grading of print quality

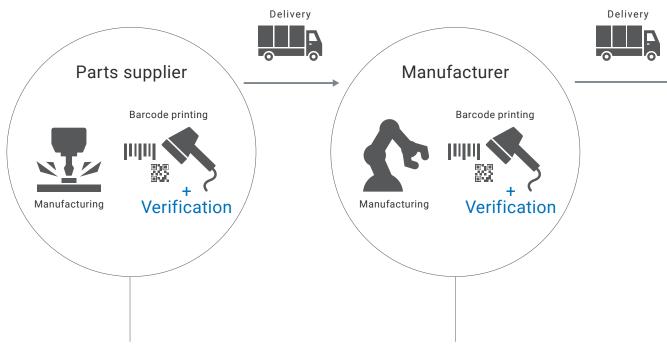You can easily identify defect causes and share target grades with your suppliers.

Grade:

0.0 to 4.0

ISO verification just after printing ensures barcode quality, increasing the credibility of products and companies

Codes are increasingly used at the distribution and consumption levels as well as the manufacturing process. One of the drastic measures to eliminate reading failures across a supply chain is to verify barcode quality to ISO standards immediately after barcode printing and then use the barcodes, which meet the necessary level of quality, from the upstream of the supply chain.

Delivery

Delivery

Parts supplier

Barcode printing

Manufacturing

+ Verification

Manufacturer

Barcode printing

Manufacturing

+ Verification

Prevent defective barcodes from leaving factory

Barcode quality verification just after printing barcodes on manufactured products prevents the escape of poorly printed barcodes.
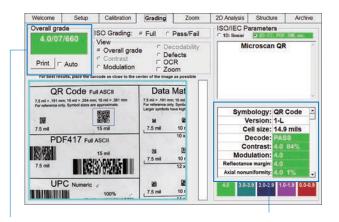
Avoid complaints and recalls

Print quality verification before shipment speeds up dealing with returns and complaints or identifying ranges affected by recalls.

Barcode verification system is a barcode grading tool

Barcode verification systems grade codes by evaluating whether printed barcodes comply with applicable standards. To ensure the accuracy of barcode verification, the standards provide print quality test specifications and verifier conformance specifications. Barcode verification systems must comply with the standards to make absolute judgments if barcodes conform to the relevant standards.
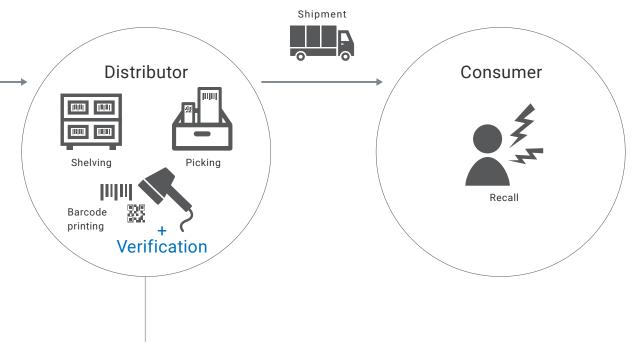
Typical verification standards for barcode print quality
ISO/IEC 29158: For 2D DPM
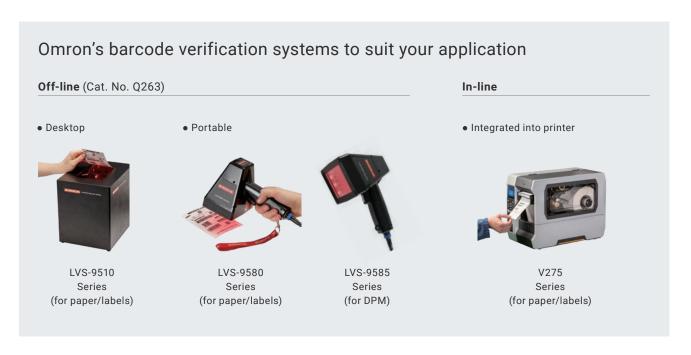ISO/IEC 15415: For 2D codes
ISO/IEC 15416: For linear codes

An overall grade from 0.0 to 4.0 is determined from the results of individual verification items. A grade closer to 4.0 indicates a better quality.

Quality is graded through verification items specified in international standards.

Shipment

Distributor

Shelving   Picking

Barcode
printing
+
Verification

Consumer

Recall

Optimize logistics operations

Improved barcode quality reduces reading failure during picking, increasing productivity.

Omron's barcode verification systems to suit your application

Off-line (Cat. No. Q263)

In-line

● Desktop   ● Portable

● Integrated into printer

LVS-9510
Series
(for paper/labels)

LVS-9580
Series
(for paper/labels)

LVS-9585
Series
(for DPM)

V275
Series
(for paper/labels)

Meets strict regulations, with nearly 20 years proven track record in Europe and U.S.

Laws and regulations are increasing to prevent counterfeit medicines from entering supply chains and control quality of medical devices

One example is the U.S. Food and Drug Administration's (FDA[*1]) UDI regulations[*2]. In order to share information throughout a supply chain, UDI regulations require to apply linear or 2D codes in which product identification information is encoded and to verify barcodes to ISO standards before shipment. Prescription medication and medical device manufacturers and OEMs who ship products to newly regulated countries need to meet UDI regulations (1.5 or higher ISO grade) within a period of grace.

Assuring compliance and reliability in the medical supplies industry

Compliant with ISO/IEC and other international standards

Our barcode verification systems, planned and developed in the U.S. that leads in terms of laws and regulations, meet UDI and other requirements of U.S. and European laws and regulations. We are continuously working to make products conform to upgraded standards by participating in standards organizations. In addition, our long-term product supply offers you peace of mind.

ISO conformance standards
ISO/IEC 15415, 15416, 15426-1, 15426-2, ISO/IEC 29158

Used in European and U.S. medical supplies industry[*3] for nearly

20 years

21 CFR Part 11 compliant-ready for medical supplies industry

21 CFR Part 11, established by the FDA, is a regulation to prevent falsification of electronic records and electronic signatures. The FDA requires electronically processed records related to development and production, and the whole manufacturing process must conform to Part 11. Our barcode verification systems have the required abilities to meet the requirements.

User Administration (Active Directory compatible)

Audit Trail

Login requires a user ID and password.

Operational permissions can be set for each user.

The date and time of user entries and actions are recorded for auditing purposes. The audit trail reports can be stored in a database.

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*1. The U.S. Food and Drug Administration (FDA) is the government organization that is responsible for regulating foods and pharmaceuticals in the U.S.

*2. Unique Device Identification (UDI) is an identifier to appropriately identify medical devices through distribution and use. UDI is intended to provide internationally accepted medical device identification and coding. In September 2013 the FDA published its final ruling for UDI, and the regulations are spreading in the U.S., European countries, and Asian countries.

*3. Prescription medication and medical device industries.

Verification of various barcodes used in prescription medication and medical device industries

Supporting linear and 2D codes compliant with standards for medical supplies

In addition to verification of a wide range of linear and 2D codes, the barcode verification system can read and verify multiple barcodes simultaneously.

Typical available symbologies

For prescription medications

(01)04912345678904

GS1 DataBar Limited

(01)04912345678904

GS1 DataBar Stacked

(01)04912345678904(17)991231(10)omron123456789

GS1-128

For medical devices and vitro diagnostic medications

(01)04912345678904(17)991231(10)omron123456789

GS1-128

GS1 Data Matrix

Reads and verifies multiple barcodes simultaneously

Easy 3-step verification

The pre-installed menu facilitates adjustment of verification conditions for individual barcodes and calibration. You can verify barcodes in just three steps. The easy-to-use user interface allows on-site operators to operate the system easily and quickly.

1. Select verification standard

2. Perform calibration

3. Perform grading

In-line inspection of every barcode printed on labels V275 Series

The V275 Series is a label printer with an integrated barcode verifier, automatically inspecting 100% of printed labels for print quality without a separate barcode verifier. It also has blemish detection, optical character recognition (OCR), and optical character verification (OCV) capabilities as well as barcode print quality verification.

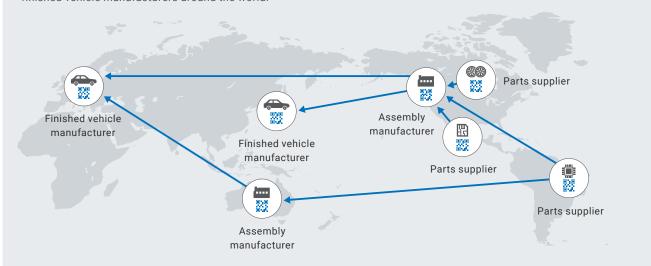Verifies barcodes just after printing

barcode verifier

Maintains barcode quality to meet customer requirements

As EV parts are distributed globally, readability of barcodes is becoming more crucial

The shift to EVs increases items managed by finished vehicle manufacturers. In the entire supply chains, the global manufacturing and distribution of EV parts is growing more than ever before.

This raises the importance of reliably reading barcodes at every process in parts suppliers, assembly manufacturers, and finished vehicle manufacturers. To ensure reliable barcode reading in the entire supply chains, finished vehicle manufacturers require print verification, and parts suppliers and assembly manufacturers independently verify barcodes to demonstrate their reliability to finished vehicle manufacturers around the world.

Finished vehicle manufacturer

Finished vehicle manufacturer

Assembly manufacturer

Parts supplier

Parts supplier

Parts supplier

Assembly manufacturer

Ensure barcode quality in entire supply chains

With our barcode verification systems compliant with ISO and other international standards, parts suppliers and assembly manufacturers can objectively check barcode quality, preventing low-quality barcodes from reaching the market before shipment. Then assembly manufacturers and finished vehicle manufacturers also check barcode quality with the barcode verification systems when receiving parts. This prevents reading failure and ensures print quality in the entire supply chain.

ISO
Parts supplier

ISO
Assembly manufacturer

ISO
Finished vehicle manufacturer

Print quality verification using our international standard-compliant barcode verification systems benefits all companies involved.

Deliverer

- Ships products that meet the required barcode print quality standards.
- Gains customer confidence by outputting reports of barcode print quality verification results

Example: HTML format report

Recipient

- Checks barcode quality when receiving parts
- Quantitatively requests suppliers to improve quality

Displays results for individual verification items

Verify various barcodes, ranging from barcodes on labels to DPM

Increase in traceable parts requires verification of a range of barcodes. The LVS Series reliably verify a broad variety of barcodes including codes printed on labels and DPM barcodes.

Reduce reading failure by verifying DPM

The LVS-9585 Barcode Verification System for DPM can verify 2D codes directly marked on metal and PCBs. Featuring a 5 Mpix camera, the LVS-9585 Series reads and analyzes barcodes down to 0.15 mm (0.05 mm for the LVS-9585-DPM-HD). Ensuring consistent print quality between factories mitigates reading errors. Also, parts can be traced quickly in case of a recall.

Difference between grading by standard barcode readers and verification by barcode verification systems

Some barcode readers provide grading of the print quality of barcodes they scan. However, barcode readers that do not comply with the standards for verification can only perform relative evaluation, the results of which depend on the distance from the object and lighting conditions. Barcode verification systems can carry out highly reproducible verification in ISO-compliant conditions (installation distance and lighting). Absolute evaluation according to ISO standards allows the verification results to be used as evidence of the quality verification.

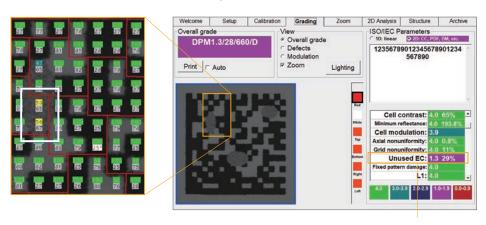|	Illumination	Calibration	Verification algorithm
Barcode verification system	Compliant with ISO standards	Compliant with ISO standards	Compliant with ISO standards
Barcode reader (grading)	Manufacturer-specified	None	Compliant with ISO standards

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Improve quality by identifying causes of print defects

Our barcode verification systems can analyze barcodes, helping improve barcode print quality based on analysis results. You can quickly increase yield by enhancing barcode quality.

Example of a print defect: A barcode is partially damaged.
(Possible cause: Blemishes such as oil stains and dust on the barcode)

Error details can be checked

In this example, the yellow cells (inside the white frame) indicate defective light cells recognized as dark cells, or vice versa.

Verification standard: ISO/IEC 29158   Error item

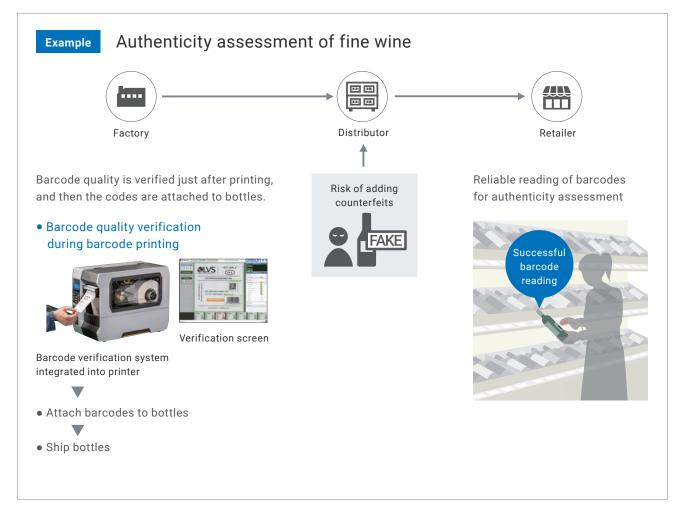# Ensures reliable barcode reading, supporting authenticity assessment

Reliable barcode reading in supply chains is key to solving the issue of counterfeits entering the market

In recent years there has been concern that imitations of expensive products are coming onto the market. Food and beverage that affect people's health directly are especially critical. To address such concern, authenticity assessment systems, which print barcodes containing a serial number on genuine products, are increasingly built. Ensuring barcode print quality before shipment is vital to reliable operation of these systems.

Verify print quality of barcodes for authenticity assessment before shipment

Unreadable barcodes for authenticity assessment may result in costly complaint handling and disposal, plus damage the labeled product's perceived quality. Our barcode verification systems verify barcodes before dispatch from factories, preventing low quality barcodes from entering the market and avoiding barcode reading failure.

Example   Authenticity assessment of fine wine

Factory → Distributor → Retailer

Barcode quality is verified just after printing, and then the codes are attached to bottles.

● Barcode quality verification during barcode printing

Verification screen

Barcode verification system integrated into printer

▼

● Attach barcodes to bottles

▼

● Ship bottles

Risk of adding counterfeits

FAKE

Reliable reading of barcodes for authenticity assessment

Successful barcode reading

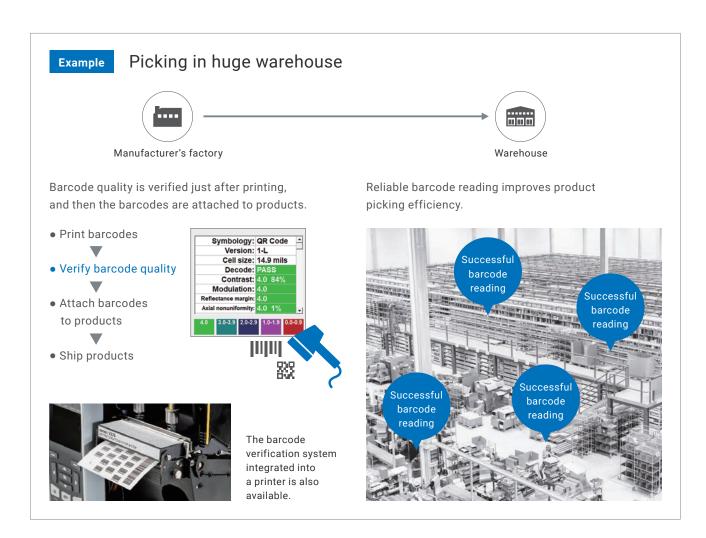# Makes logistics operations more efficient by verifying barcodes

Poorly printed barcodes hinder improving operational efficiency of logistics

Many people are working to move, store, manage, and ship goods in warehouses. However, against a backdrop of labor shortages and worsening working environments, warehouses are under urgent pressure to streamline operations and improve environments. To tackle this challenge, they are using barcodes to increase operational efficiency, but facing another problem of reading failure to overcome.

Improve operational efficiency by preventing reading failure

If barcodes on labels cannot be read during product picking in a warehouse, workers need to check product information and manually enter data. This compromises the operational efficiency. Print quality verification with our barcode verification systems before factory shipment boosts work efficiency by eliminating unreadable barcodes.

Example   Picking in huge warehouse

Manufacturer's factory → Warehouse

Barcode quality is verified just after printing, and then the barcodes are attached to products.

- Print barcodes
  ▼
- Verify barcode quality
  ▼
- Attach barcodes to products
  ▼
- Ship products

Symbology:	QR Code
Version:	1-L
Cell size:	14.9 mils
Decode:	PASS
Contrast:	4.0 84%
Modulation:	4.0
Reflectance margin:	4.0
Axial nonuniformity:	4.0 1%

4.0	3.0-3.9	2.0-2.9	1.0-1.9	0.0-0.9

The barcode verification system integrated into a printer is also available.

Reliable barcode reading improves product picking efficiency.

Successful barcode reading

Successful barcode reading

Successful barcode reading

Successful barcode reading

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