

## FQ-series Vision Sensors

# Application Solution Examples



The FQ-series Vision Sensors solves all of these problems.

- Quality is too low.
- Sensors are unstable.
- Traditional image processing systems are too expensive.
- We have no image processing specialists.

You do not need specialized knowledge of image processing to meet the demands for high-quality inspections in a wide range of industries. Only simple operations are necessary.



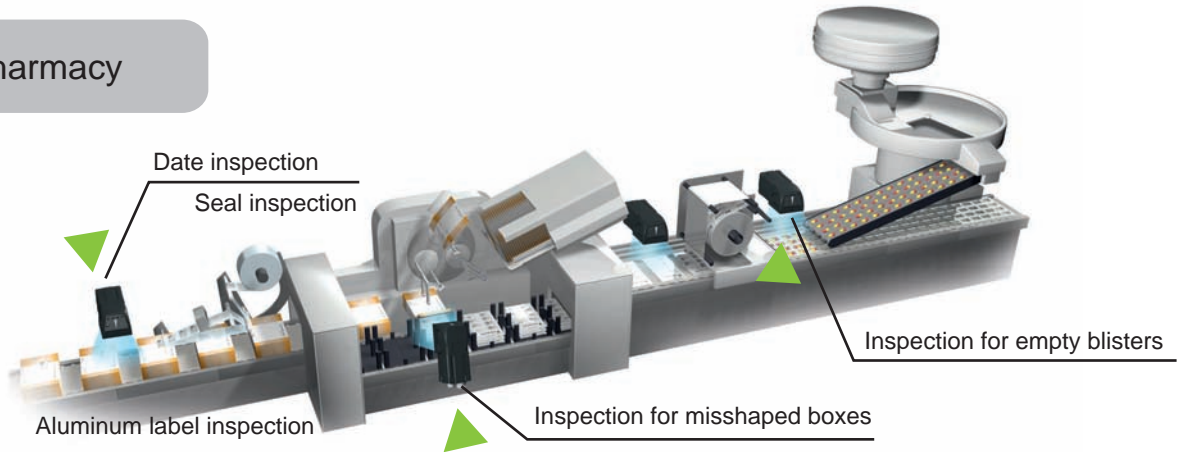
# FQ-series Vision Sensors helps you increase process quality.

Achieve Process Quality

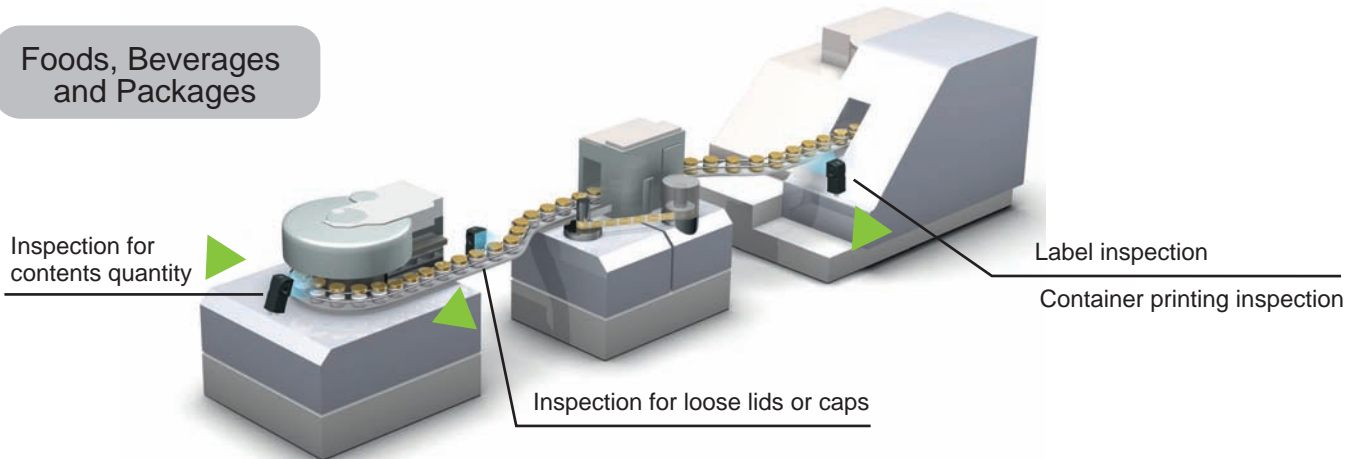
The FQ-series Vision Sensors fulfill your expectations.

Low priced, and yet with the image processing capabilities of top-end models, FQ-series Vision Sensors can be easily installed on lines wherever necessary.

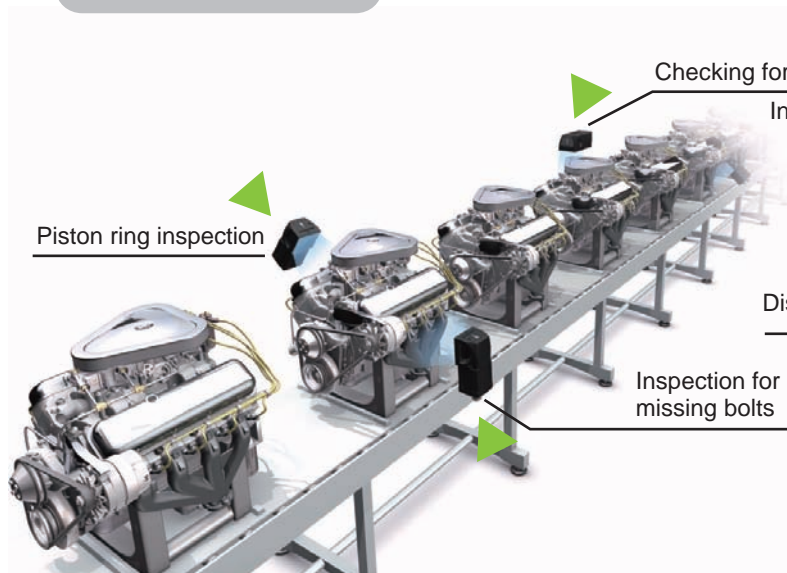
## Pharmacy



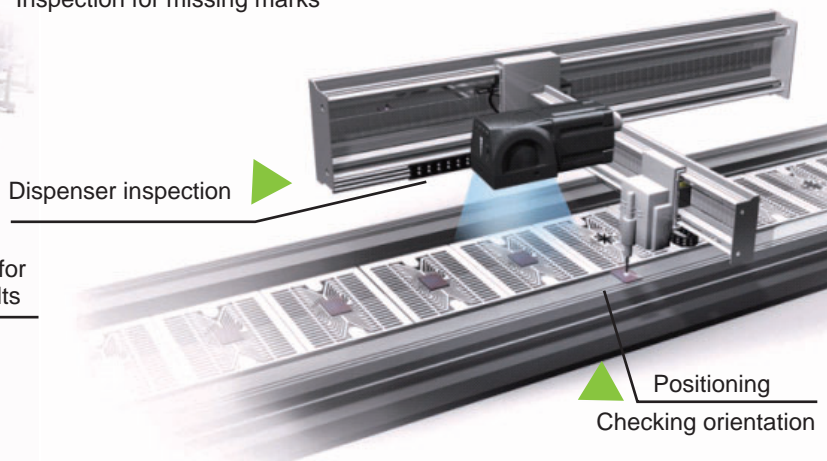
## Foods, Beverages and Packages



## Automobiles



## Electronic Components





## Inspection for Missing or Incorrect Tablet



OK



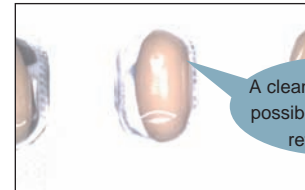
NG

Incorrect tablet

### ? Typical Problems

- Time is required for filtering or light adjustments to increase contrast between tablets and the background.
- Light reflections from the blisters and background makes inspection results unstable. Yield is low.

Original Image



A clean image is not possible because of reflections.

### ! The FQ Solution

- A polarizing filter is used to remove halation caused by the blister pack. A clear image of the tablet is achieved.
- Processing with real-color sensing enables detecting minute differences without filtering colors to detect incorrect tablets.

Using a Polarizing Filter



Reflections from the silver background and blisters are reduced.



## Position Detection for Packing Box Seals



OK

Tape edge is detected.



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Irregularities cause reflections.

### ? Typical Problems

- The shape or irregularities in the inspection object cause reflections and prevent stable edge detection.
- If the contrast between the tape and the box is low, the edge cannot be detected and time is required to extract characteristics.

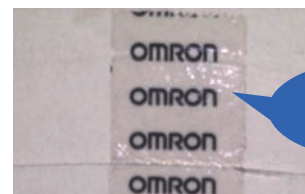
Original Image



### ! The FQ Solution

- A polarizing filter that removes only halation is used to reduce reflections.
- Even if the contrast between the tape and box is low, real-color processing enables edge detection.

Using a Polarizing Filter

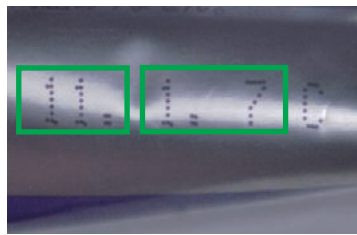


Only the reflections are reduced.

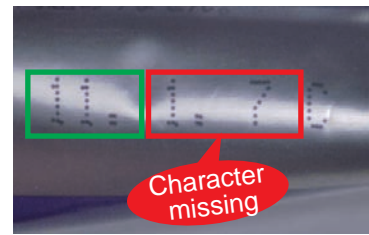




## Detecting Text on Glossy Packages



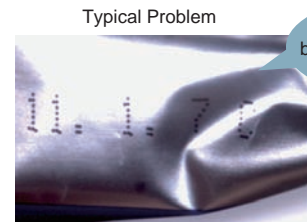
OK



NG

### ? Typical Problems

- Dark and light areas are caused by package irregularities, causing unstable detection.
- The light built into the sensor does not provide enough light for a clear image, so external lighting has to be added.

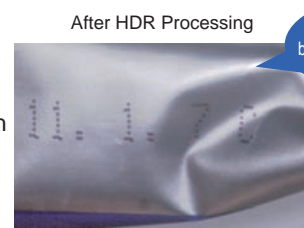


Typical Problem

Inconsistent brightness caused by irregularities

### ! The FQ Solution

- High dynamic range processing enables an image with consistent brightness without halation or black areas. The image is not affected by light reflections from the package.
- High-power LED lighting with four times the previous brightness can be combined with a polarizing filter to obtain images with no reflections (normal reflections) without adding external lighting.

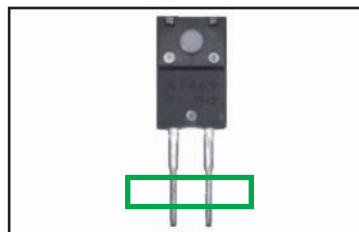


After HDR Processing

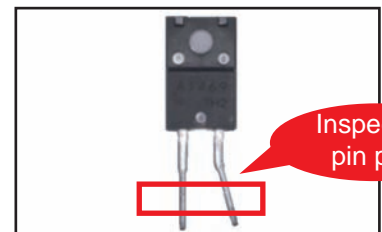
An image with consistent brightness is achieved even if there are irregularities.



## Inspecting for Bent Pins



OK

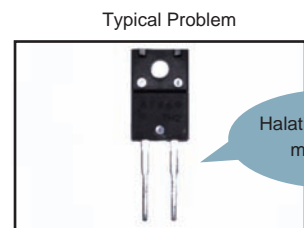


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Inspect the pin pitch

### ? Typical Problems

- Changes in position during conveyance prevents correct detection.
- Halation from the metal pins prevents stable pin edge detection.

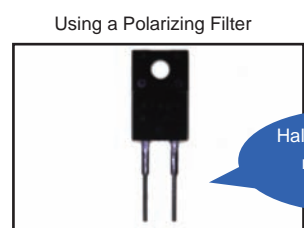


Typical Problem

Halation occurs on metal parts

### ! The FQ Solution

- Movement during conveyance can be handled with position compensation.
- A polarizing filter is mounted to reduce halation from the pins.  
Using the high-power LED lighting with four times the previous brightness enables detection without external lighting even in dark sites.



Using a Polarizing Filter

Halation from the metal parts reduced.



## Inspecting for Marks on Metal



OK



NG

### ? Typical Problems

- Light reflections from the metal cause halation, making clear images of the text difficult. Even if the lighting is adjusted, halation occurs due to tilting or light interference during conveyance, making detection unstable.

Original Image



Unstable detection due to halation or black areas.

### ! The FQ Solution

- High dynamic range processing prevents halation from metal even under near-natural lighting so that text can be clearly detected. The effects of changes in lighting caused by tilting or light interference during conveyance are also removed to enable stable detection.

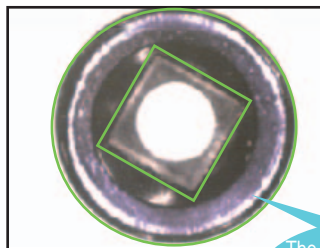
Image after HDR Processing



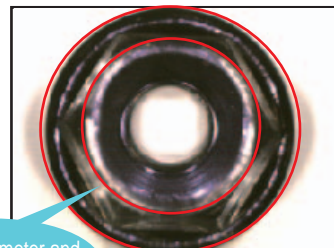
A clear image within inconsistent brightness obtained.



## Detecting Incorrect Metal Parts



Part A



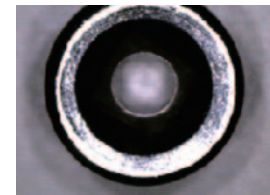
Part B

The outer diameter and inner diameter are used to detect incorrect parts.

### ? Typical Problems

- The light reflection rate varies with the depth in the inspection object. Under the same lighting conditions, some areas are too bright and some too dark. Several images must be taken under different lighting conditions, but settings and control are complicated.

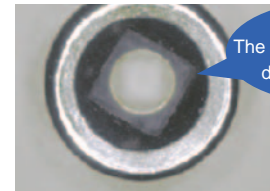
Original Image



### ! The FQ Solution

- High dynamic range processing produces an image with consistent brightness under the same lighting conditions even for inspection objects with inconsistent brightness caused by different depths or materials. It is not necessary to take several images under different lighting conditions, so work is reduced in settings and control.

Image after HDR Processing



The square on the inner diameter is clear.



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