

# AUTOMATED VIAL INSPECTION WITH BASLER CAMERAS: A COVID-19 VACCINE SAFEGUARD



**CUSTOMER: TRUKING TECHNOLOGY LIMITED**

**LOCATION: CHANGSHA, CHINA (HQ)**

**INDUSTRY: PHARMACEUTICAL EQUIPMENT**

**IMPLEMENTATION: 2020-2021**

**CUSTOMER STORY**

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## APPLICATION

Truiking Technology is a leading pharmaceutical equipment supplier with over 20 years experiences in healthcare packaging and various automation system for the biopharma industry.

The coronavirus pandemic spurred a global cooperation for vaccine research and distribution, and resulted in creating one just under a year. But a vaccine is only effective if people manage to receive it, and thus supply chains came under pressure to meet this sudden unprecedented vaccine demand. To support the fight against the pandemic, Truiking Technology is committed in delivering automatic visual inspection systems to ensure vaccine safety and product integrity with speed.

Glass vials are used to store the liquid vaccine and during the massive filling work, it is inevitable that defects in filling and sealing will happen. Various visual inspections are required to assure that vials contaminated or with defects are excluded from the batches. Some of the inspection tasks include:

- To identify any foreign bodies, glass particle, fibre-like material, etc. in the vials
- To check the presence/absence of vial cap and flip-off seal, the position of the cap, and the filling level.
- To detect cosmetic and functional defects of the vials

Key challenges in the inspection tasks are:

- Adding up all of the dimensional, physical and cosmetic features, the system need to inspect many attributes in a very compact space.
- Detecting defects from cylinder surfaces with a vision system is difficult. The vials are transparent, filled with clear liquid and moving; they have bubbles inside them and they are reflective.
- High speed, accuracy and stability is required.

## SOLUTION AND BENEFITS

TruKing Technology develops different automatic vial inspection systems for different tasks, using camera bundles provided by Basler.

### Solution One:

**Main tasks:** Vaccine Liquid Inspection and Vial Cosmetic inspection

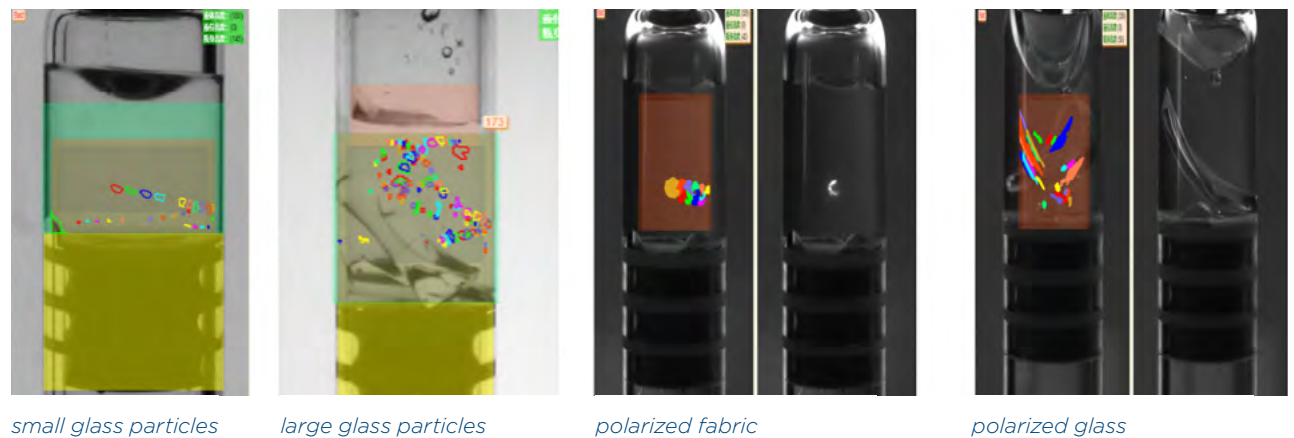
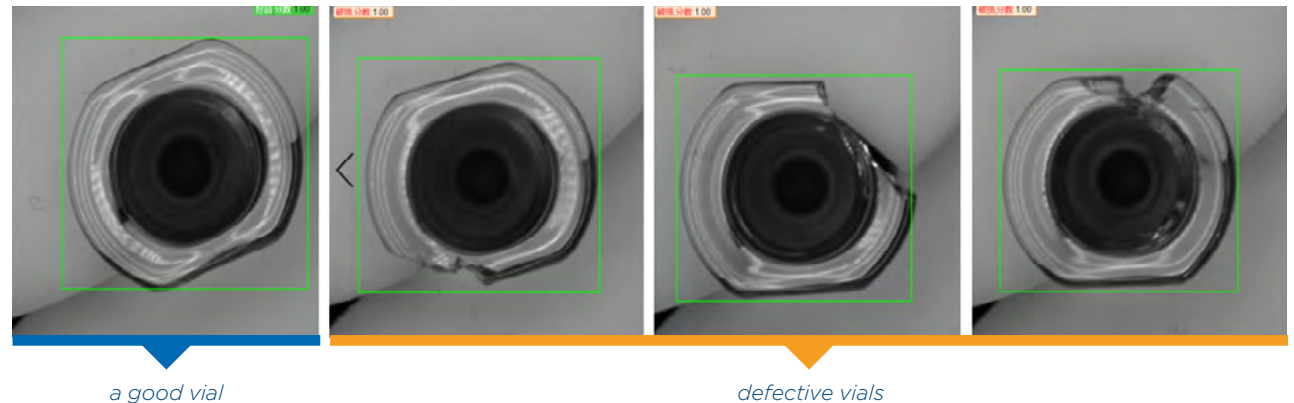
**Configuration:** 16-20 pcs \* acA1300-200um area scan cameras

Sixteen to twenty high-speed cameras are installed in the inspection system to acquire image sequences of different parts of vial batches, providing basis for image analysis. The multi-camera system is able to judge if a product is good or defective by comparing multiple images using its powerful vision software. The advanced vision algorithm and deep learning algorithm is able to identify contaminations and defects.

AI algorithm is utilized to learn the movement of bubbles in order to distinguish bubbles from foreign bodies, including glass particles, metal grains, fibres, and hair, in the vaccine liquid. The filling levels are also inspected.

At full resolution, acA1300-200um works at 200 frame per second, and the acquisition speed can reach even higher in ROI mode.

TruKing's inspection solution utilizes multiple cameras to acquire images from different view angles simultaneously, significantly enhancing the inspection efficiency and accuracy. The market-proven multi-camera set-up with USB 3.0 interface by Basler is the ideal fits for such solution and offers the benefits of high efficiency, perfect synchronization and high reliability.





## Solution Two:

**Main tasks:** Vial Surface Cosmetic Inspection

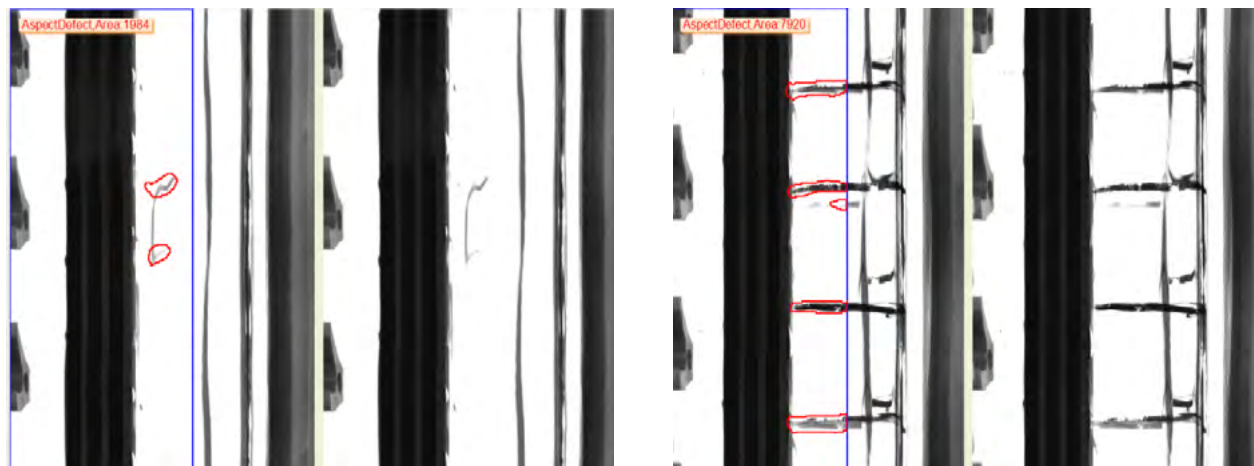
**Configuration:** 2 pcs \* raL2048-200um line scan cameras + FA lenses

The second inspection system comes with two high-resolution line scan cameras and FA lenses, as well as specially designed lighting arrangements. It inspects the cosmetic defects on the cylindrical surface of the vial, including cracks, scratches, refractory stones and black spots.

Line-scan vision inspection is an ideal choice for imaging cylindrical objects on fast moving inspection lines. As the vaccine vial rotates, the line scan camera unrolls the entire surface of a vial line by line into a 2D flat surface for inspection.

Replacing human visual inspection with automatic inspection systems in the biopharma quality control process is quite common nowadays, as the latter provides far better efficiency and accuracy in inspection results. The key goals in glass vial inspection for COVID-19 vaccines are providing error-free quality assurance with speed. TruKing's inspection solutions utilize advanced vision algorithms and AI technology to ensure the inspection efficiency and accuracy.

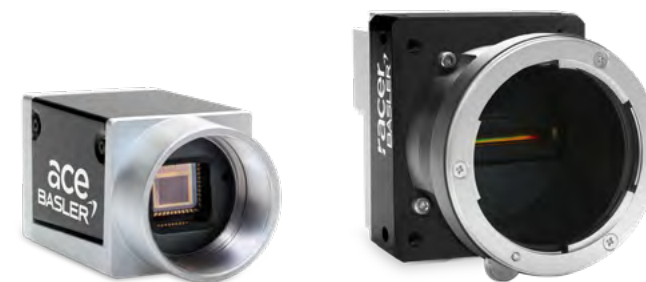
"TruKing is committed to delivering high-performance inspection systems to our customers ahead of schedule," the purchasing manager at TruKing explains. "We are racing against time in such crisis. The most important reason for us to collaborate with Basler is excellent stability, especially in multiple high-speed cameras with USB3.0 interfaces set-ups. Basler is a market leader and has rich experience in such set-up. Their expertise helped us to reach our goals. Ease-of-use software is also critical for us to achieve fast development. The pylon Camera Software Suite is easy to adapt to and functions seamlessly, saving us precious development time. Besides, the excellent and timely service and support by the local team makes our partnership a great success."



Line scan cameras perform better in inspecting cylindrical surfaces

## TECHNOLOGIES USED

- Basler *ace U acA1300-200um*
- Basler *racer raL2048-48gm*
- FA lenses



Basler *ace U acA1300-200um* Basler *racer raL2048-48gm*



## MORE INFORMATION

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