



Intego
Vision Systeme

Automatic inspection of mobile phone covers

Area of application

Before assembly, high quality painted parts such as mobile phone covers must be checked for surface defects. Current productions often still incorporate manual inspection, which results in high cost with minimal chance of accurately reproducible inspection results.



Painted mobile phone casings require meticulous inspection before being deemed 100% free of faults in the lacquer finish.

The ZIRKON inspection system offers a fully automated solution for this inspection process. It identifies errors in lacquer by examining the outer layer in its entirety and generates a binary quality signal for each tested casing. Additionally, a statistical summary of error distribution during inspection can be generated for any period of the inspection process. Therefore, possibilities of optimizing the production process can immediately be recognized and implemented.



Zirkon inspects different types of mobile phone casings with an examination cycle of 2.5 seconds per part.

Switching between different kinds of cover geometries only requires set-up time of less than 15 minutes.

Preconditions for deployment

Automatic quality control inspection of mobile phone casings is suitable for continuous production of high lot numbers. Inspection is carried out on the entire outer layer.

An integrated cleaning station being equipped with rotating blast pipes assures the purification of intermediately stored parts. Consequently, high pseudo - error rates caused by dust are averted.

The optical probes incorporated in the optical imaging handling module compensate for any variations in ambient lighting. As a result, no restrictions need to be made on the environmental lighting conditions.

The inspection system will be delivered with a complete transfer system loop. One side of the system is reserved for the supply and removal of the parts. The supply can either be managed via stacking systems from trays or can directly be integrated into the production process. Thus, even refitting of already existing paint finishing systems or in lines for further processing is possible.

The inspection cycle time is 2.5 seconds. Additional models with other throughput times are available by request.

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Technical Data

Components of the inspection system

The optical inspection system consists of a transfer system with jigs, carrying the phone covers, a cleaning device for the removal of loosely adhering dust deposits, as well as several interlinked single inspection units.

The single inspection units contain optical probes and their respective illumination equipment, as well as electrical adjusting mechanisms to adapt to various item geometries. In the inspection stations, the complete surface will be illuminated in such a way that even small defects are detected.

The evaluation unit is integrated into the system. Results are shown on a user monitor, where system parameters can be changed, inspection results can be supervised, and external operating signals can be tapped.

A permanent filing of the optical data is also available on request. This, in combination with part numbers, allows for comprehension of the inspection results at a later point of time. Simultaneously, further estimates of the eject rate can be made before changing parameters.

Inspection sequence

The parts to be inspected are stacked on the input tray via the system's handling unit, where they are analyzed after cleaning.

During operation, the user can observe the current inspection status and the image of the respective part.

Upon completion of the inspection, the results are displayed. The result is emitted as binary signal at the unloading zone of the transfer line.

Avoiding faults instead of detecting them

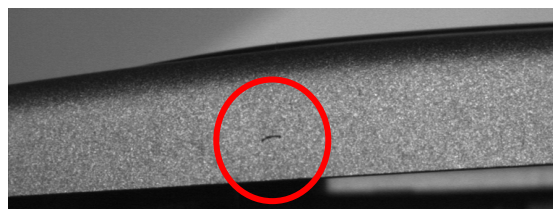
Immediate automatic fault recognition saves not only on the cost of inspection, but also serves to decrease fault rates, since fault sources are immediately detected and reported, allowing for instant shut down to rectify the fault's source .

Typical faults for optical inspection

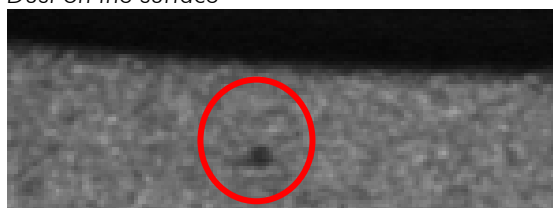
The following categories of errors are especially relevant for the inspection of mobile phone covers:

- **Inclusions of contaminants**
Inclusions of dust, lint, or residual paint on the lacquer surface are the most common causes of defect.
- **Mechanical damaging**
Errors such as scratches in the lacquer are detected.
- **Adherence defects**
Bubbles in the lacquer are detected.

The following figures show typical examples of occurring faults.



Dust on the surface



Inclusion, Contaminant



Bubble