



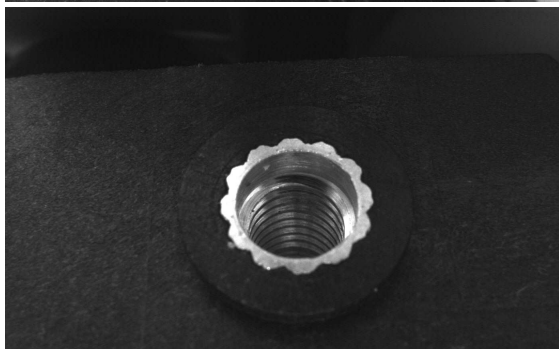
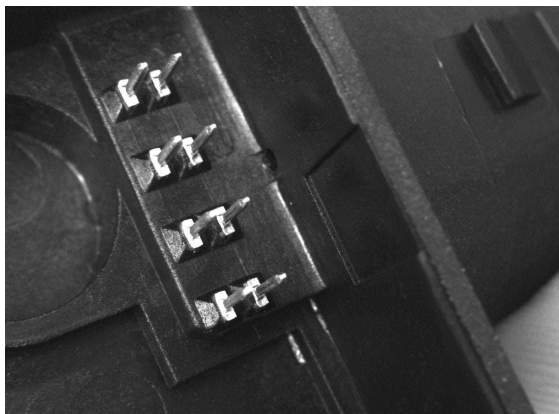
Intego
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ONYX Plastic-coated Metal Parts Inspection System

Area of Application

Plastic-coated metal parts, such as connectors in the automotive branch, place demanding high requirements on manufacturing quality. The smallest manufacturing faults can lead to disruptions in subsequent processing steps or even in terminal devices. For example, bent pins can destroy entire electronic boards during assembly and thus cause great economic damage.

As a result, such manufacturing faults must be reliably recognized and consistently sorted out. Continuous faults should be discovered quickly in order to keep rejection rates low.



Plastic-coated metal parts, here pins and threaded bushings, are inspected 100% of the time.

The ONYX inspection system checks plastic-coated metal parts for typical injection molding, stamping, and surface faults completely automatically. The system is part of the manufacturing chain, is fully automatic, and is used for example directly after the parts are removed from the injection molding machine.

Based on the inspection signal, the faulty parts are sorted out directly and the good parts are either sent back to further processing or packaging. The inspection is conducted as a 100%-final inspection. Various statistical evaluations, such as those regarding types of faults, are possible as well as the export of the inspection results to a customer's production data acquisition system, the classification in batches of parts and the storage of the inspection data.



Design variant rotary table with conveyor belt feeding of the parts into the ONYX inspection system.

Prerequisites for Use

The inspection system is suitable for highly automated manufacturing lines from the application areas of telecommunications and automotive. The inspection system is particularly economical where a product is manufactured in continuous operation.

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Components of the Inspection System

The inspection system consists of image acquisition and evaluation components and, depending upon the connection to the production, also handling and automation components.

The inspection unit contains the optical inspection heads (cameras and possibly telecentric optics) with the related lighting systems. Depending upon the connection to the production, an integrated rotary table can bring the parts to the individual inspection positions, for example.



An inspection cycle with various lighting situations from different perspectives makes reliable recognition of all types of faults possible.

An integrated evaluation computer with user and machine interfaces controls the entire inspection system. Here, system parameters can be adjusted, inspection results monitored even by cavity, and external control signals picked up.

The system works under normal environmental conditions. Changes to the surrounding lighting are blocked by the housing of the inspection heads in the image acquisition unit.

Inspection Procedure

The parts are placed in the inspection positions one after another by the parts handling. Here, the plastic-coated metal parts are inspected under suitable lighting. All of the control systems for this are integrated.

After the completion of inspection, the inspection results are displayed on the operator screen and

forwarded to handling by means of the control interface, in order to perform the sorting out of defective parts there.

The inspection cycle is between 2 s and 15 s per part, depending upon the size and complexity of the parts and the inspection.

Typical Types of Faults

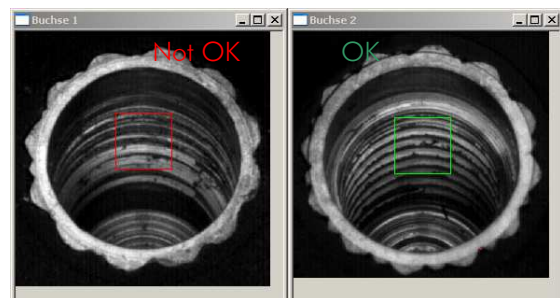
The following types of faults can be reliably recognized and are relevant for the inspection of plastic-coated metal parts:

Plastic area:

- Inclusions of foreign material (such as chippings)
- Short shots and flashes
- Sprue or ejector
- Dimensional errors

Metal area (such as conductors, pins, threads):

- Dimensional errors (such as bent pins or missing threads)
- Stamping faults
- Scratches



Fault image: missing threads.

When a fault is recognized, a control signal is generated to sort the part out. In case of continuous faults, an operator call can be made. In addition, cavity-dependent statistical recording of the faults provides information for optimization possibilities in manufacturing.

Avoiding Faults instead of Simply Detecting Them!

Process-oriented automatic fault recognition not only saves inspection costs, but also reduces error rates as the causes for rejections in the process are immediately recognized, allowing them to be quickly remedied.