stoba
Customized
Machinery

InspectorONE

Automated optical
quality inspection with
artificial intelligence

InspectorONE is a self-learning machine for visual inspection of components and products of any kind. Equipped with cameras and Deep Learning software, the device quickly and automatically inspects components and products. The Deep Learning software continuously improves its own cognition capabilities in the process. InspectorONE can be easily integrated into existing production lines.

VISUAL INSPECTION

Increase efficiency through AI-based quality control

01	Scan and recognize components
02	Checking features
03	Detect anomalies
04	Matching anomalies to previous parts
05	Determination of rejection criteria/boundary conditions
06	Using the detected data to optimize upstream processes

![stoba]

Exceptional possibilities with InspectorONE

InspectorONE offers absolute process reliability in quality control. Limit conditions for rejects can be individually defined. Separate between scrap or rework.

FLEXIBLE	For a wide variety of components and materials	**EFFICIENT**	Different components can be tested simultaneously
FAST	Lowest cycle times	**THOROUGH**	Almost error-free scalable inspection criteria
PLUG & PLAY	Easy integration into existing production chains	**OPEN SYSTEM**	Easy connection to existing Smart Factory system possible
FULLY AUTOMATIC	Use of industrial robots and workpiece carrier systems	**INTELLIGENT**	Use of self-learning feature recognition software

Possible options:

The basic equipment can be supplemented with additional components: These include microscopes, eddy current inspection, laser displacement sensors, profile projectors, DMC code readers, laser marking and much more …

ROBOT / For automated handling	**MICROSCOPE** / For accurate results (µm)	**3D CAMERA** / Measurement of 3D surfaces, creation of cloud points	**EDDY CURRENTS** / Control of cracks and materials	**DATA ANALYSIS** / Production process management, finding the causes of poor quality

ASSESSMENT:

When is InspectorONE involved?

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To detect surface defects such as scratches	To inspect parts by 360° rotation
To detect contaminants such as chips on sealing surfaces	For simultaneous inspection of different products/parts on one machine
For the detection of particles in liquids	
For the detection of air bubbles in the material	For clean room applications
For mass parts	For dimensions & alignments
For particularly high-quality components	For checking the completeness of assemblies, e.g. printed circuit boards

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USE CASE:

Testing the outer and inner shell of a twisted tube

REQUIREMENT:

The machine has a maximum permissible cycle time of 3.2 s, including handling times. A total of 28 different features are inspected on all visible (external as well as internal) surfaces in the specified time.
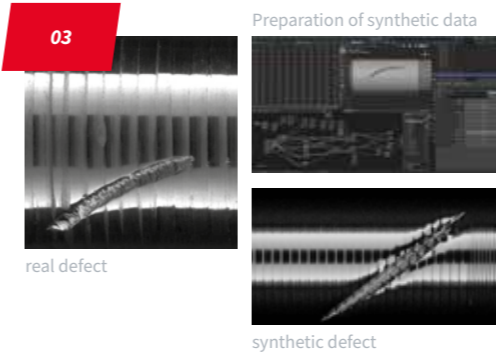
PROCESS

01

02

Optobox

individual camera positions

illuminated cavity d = 3.3 mm   telecentric unit
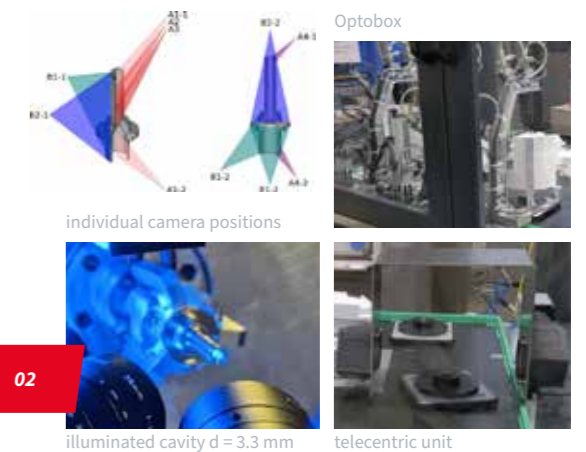
Clarify requirements

Workpiece	Test process
Material	Cycle time

03

real defect

Preparation of synthetic data

synthetic defect

Image recording from all perspectives

The machine has a total of 17 cameras located at different angles to the axis of the component being inspected.
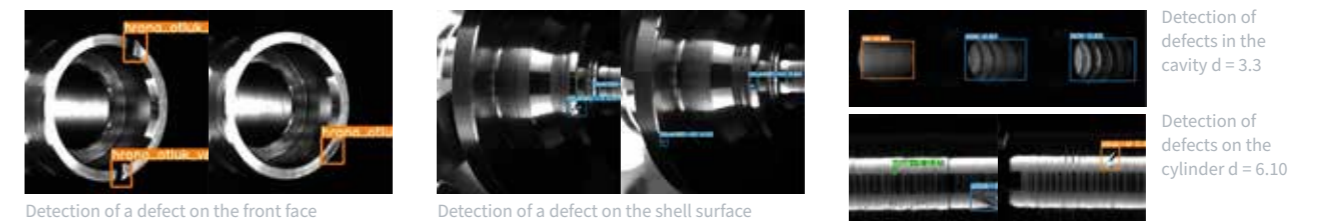
Deep Learning Process

In the application, a total of 18 neural networks are used to detect specific defects and 18 networks are used to detect anomalies. In the learning process, artificial data, so-called synthetic data sets, were used to teach the software very rare defects. A complete scenario of all possible deviations was created in the 3D environment and individual defects were automatically generated. From this, the neural networks learned to make decisions about whether the deviations were actually defects. After the short learning phase, in which real data and synthetic data are collected simultaneously, InspectorONE can be used for visual inspection and make decisions autonomously.

AI in action

Inspector.ONE identifies deviations of all kinds, can trace where the defects come from, and can predict possible future defects through AI

04

Detection of a defect on the front face

Detection of a defect on the shell surface

Detection of defects in the cavity d = 3.3

Detection of defects on the cylinder d = 6.10

Contact us!

For questions, comments, interest contact us directly:

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