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## NELA Inspection Systems For Metal Production & Processing

NELA's optical inspection and sorting systems are pioneering in the monitoring of manufactured products. They offer specialised inspection solutions for a wide range of applications, from dimensional inspection to detailed defect detection.

These systems set the highest quality standards by visually inspecting surfaces and detecting defects such as scoring, rust, impact marks and edge integrity.



# Quality is Everything

# Automation with visual inspection systems



**Glass Table Systems**  
Highly precise 100%-inspection from all sides. Parts can be turned over by 180° during inspection.




**Indexing Systems**  
With an individual handling of each part, ROVI provides a significant extension of optical inspection possibilities with tactile inspection, 360° rotation, or crack detection.




**Belt Systems**  
LIVI for inspection of one or both sides of the part, with minimized touchpoints.



**Inspection Parts**  
NELA inspection systems are suited for metal parts with varying sizes, geometries, and material properties.



**Optical Inspection**  
Inspection of surfaces and threads as well as dimensions including shape and position tolerances at high throughput rates.



**Hardness Check**  
An eddy current unit can be fully integrated into the NELA system without any loss of productivity. Including statistical evaluation.



**Feeder**  
Integration of fully automatic feeding units like bowl feeders, turntables, or handling systems tailored to individual applications. Bunkers available.



**Handling Systems**  
Systems for customised inspection tasks that go beyond the module-based standard systems, e.g. robot handling for complex components.



**Packaging**  
Gentle sorting of good parts via belt chutes into linear and rotary indexing batchers or bag packers. Integration with existing customer systems possible.

Optical measurement and inspection of all types of metal parts can be automated with NELA's inspection and sorting systems. The modular machine concept makes it possible to offer a customised solution for every application, depending on the shape, size, material properties and inspection requirements. The focus is always on the specific inspection requirements for metal parts.

Depending on the application, there is a choice of glass disc and conveyor-based or indexed inspection platforms, which can also be combined with robot handling or other special machine concepts if required. In combination with NELA's Vision-Check image processing software, this results in extremely powerful and efficient inspection cells that guarantee a 100%-inspection of your components.

## Turned parts ♦ Fasteners ♦ Sintered parts ♦ Fine-blanked parts

### Materials (selection):

- Stainless steel
- Steel
- Brass
- Aluminum
- Bronze
- Copper
- Plastics
- Precious metals
- Special materials

### Defect types:

- Grooves
- Damaged spots
- Roughness
- Rust
- Integrity of edges
- Chipping marks
- Chatter marks
- Oxidation

### Surface characteristics:

- Matte - shiny (or even reflective)
- Coated - uncoated
- Treated - not treated

## Benefits in your production process:

- Customized 100%-control of your serial parts
- High throughput of up to 600 parts per minute
- Careful, non-destructive handling of your parts
- Optional eddy current inspection
- Repeatable inspection results
- Documented quality
- Flexible and efficient system, steady and reliable
- Connection to PDA; Statistical Process Control, OPC-UA, Industry 4.0

# Geometry control and Surface inspection methods



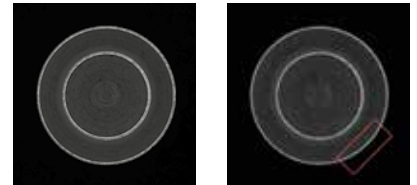
## Surface Inspection

Inspection of all surfaces on top and bottom side as well as all lateral surfaces of the parts to detect previously defined defects. Different sensors with appropriate optical and illuminative components will be used to achieve the best possible contrast. (Example: reflected light)



## Lateral Inspection

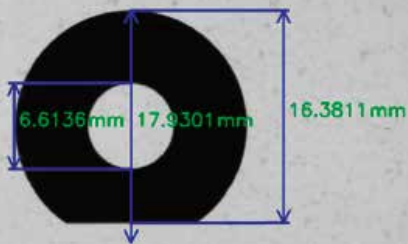
Customised surface sensors for top/bottom faces and lateral surfaces ensure high-precision detection of component inhomogeneities.



## Edge Detection

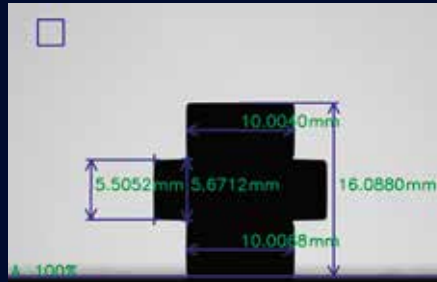
Different types of illumination are used to optimally recognise specific surface defects.

In the example: Defect evaluation with dark field illumination.



## Dimensional Inspection

Inspection of all visible geometrical characteristics such as, for example, inner and outer diameter.



## Height Control

Measurement on up to 4 projection points to guarantee highly precise measurement results with tight tolerances. For instance, inclined upper edges can be detected with this method.



## Shape from Shading - SFS

Shape from shading is a drift and curvature measuring 3D-method which can be used for shiny or inhomogeneous surfaces. In the example, chatter marks are made visible with shape from shading technology.



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