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Fully automatic inspection system with deformation technology for special examination of elastomeric materials

Whenever highest quality standards apply, for example in certain fields of the automotive or industrial sectors, it may be required that elastomeric seals are also examined for hidden defects. Such hidden defects are, for example, nicks or dents that can only be detected when the parts are deformed. The NELA **ROVI** is an ideal platform for this application as it features an indexing table with individual holding positions in which the parts can be squeezed or stretched as they are moved under the sensors. Each inspection station consists of high-resolution cameras combined with a specifically adapted illumination so that even the smallest defects can be detected. The parts are rotated in their holding positions when they are underneath an inspection station so that a comprehensive and homogenous examination is guaranteed. The very high resolution is achieved with a throughput of up to 1,800 parts per hour.

Your benefits:

- Detection of defects that cannot be detected with other optical inspection systems
- Process and production safety through 100% inspection
- Real-time statistic process control allows early detection of problems in your manufacturing process
- All quality relevant data can be extracted from the NELA system at any time
- High-precision defect inspection on all sides of the parts



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Part sizes and deformation method:

- **ROVI-25** Outer diameter 15 mm to 25 mm with squeeze function
- **ROVI-100** Outer diameter 60 mm to 100 mm with stretch function



System specification

Dimension	
Dimension (L x W x H)	approx. 2200 x 1200 x 2260 mm (without computer monitor)
Weight	approx. 1000 kg
Machine set-up	Revolving transfer machine with 16 palettes, variable sensor set-up and rotation of the parts
Frame	Steel, powder coated
Housing	Aluminium, Steel powder coated
Application and throughput	
Material	ROVIsqueeze: O-Rings up to OD 25 mm ROVIstrech: O-Rings up to OD 100 mm
Typical application	Surface defects and crack detection on O-rings
Inspection duration	≥ 2 sec per part
Sorting function	Onto conveyor band or in boxes
Surface sensor	
Number	up to 9 stations
Min. defect size	≥ 32 µm
Resolution of the composite image	up to 30 MPixel
Illumination	LED with optical fiber and back light illumination
Camera adjustment	manual or motorized
Geometry sensor	
Position	On loading conveyor band
Min. repeatability	± 50 µm depending on the field of view size
Hardware and Software	
Controller	Master-controller with ITX-Boards for each sensor unit
HMI	15" LCD monitor with keyboard and track ball
Software	Visioncheck control and image data processing software

Geometry:

- Dimension
- Height monitoring

Defect inspection:

- Side A
- Side B
- Inner side
- Outer side

Possible Defects:

- Pores
- Holes
- Nicks
- Dents
- Flashes
- Cracks
- Flow marks
- Foreign material



About NELA:

With 75 years of tradition in high-precision machine manufacturing, originally as a supplier for the Graphic Arts industry, the family-owned company Brüder Neumeister GmbH located in Lahr / Black Forest is today also a leading system supplier for inspection equipment in the rubber, plastics, compound and sintered metal industry. With 200 employees, more than 5000 m² of production area, an own, independent development department for industrial image processing software, as well as a high degree of vertical integration in manufacturing, NELA makes sure that your inspection requirements will be fulfilled - today and in future, worldwide.



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