

# MiniMatliX

AUTOMATIC VISUAL INSPECTION MACHINE  
WITH SINGLE TABLE FOR VERY SMALL  
O-RING AND GENERIC PIECES

**UTP** VISION  
VISUAL INSPECTION



LOADING SYSTEM

①



DIMENSIONAL CAMERA

②



SURFACE CAMERA

③



UNLOADING

④



CONTROL DEVICE OF EXTERNAL  
AND INTERNAL SURFACES

OPTIONAL

**MiniMatliX** is an automatic visual inspection machine with single rotary table designed for small o-rings and generic components. It is ideal to inspect plastic, rubber or other material parts in order to identify critical surface defects such as cuts, flashes, voids, marks, stains, double-mouldings, out-of-roundness, out-of-concentricity, etc.

MiniMatliX is available in **three versions** with different fields of view up to  $\varnothing$  20 mm. In each version, the feed system loads the parts onto a conveyor belt, then a motorized diverter transfers them onto a rotary glass table. From this point on, every single part is inspected for defects and dimensional accuracy by a series of dedicated vision inspection stations.

The acquired images are transferred without any data loss to a PC managed by a **Real Time OS**, which handles both image processing and the interaction with the operator through a user-friendly interface. The system's stability is guaranteed even at extremely high inspection speeds.

After the images have been processed, pieces are sorted into three different collection areas depending on whether they are compliant, non-compliant or reworkable. Part changeover is quick thanks to the possibility of saving inspection parameters in each recipe.



LINUX



DATABASE  
INTEGRATION



STATISTICS  
REPORTS



COLOR VISION  
PATENTED



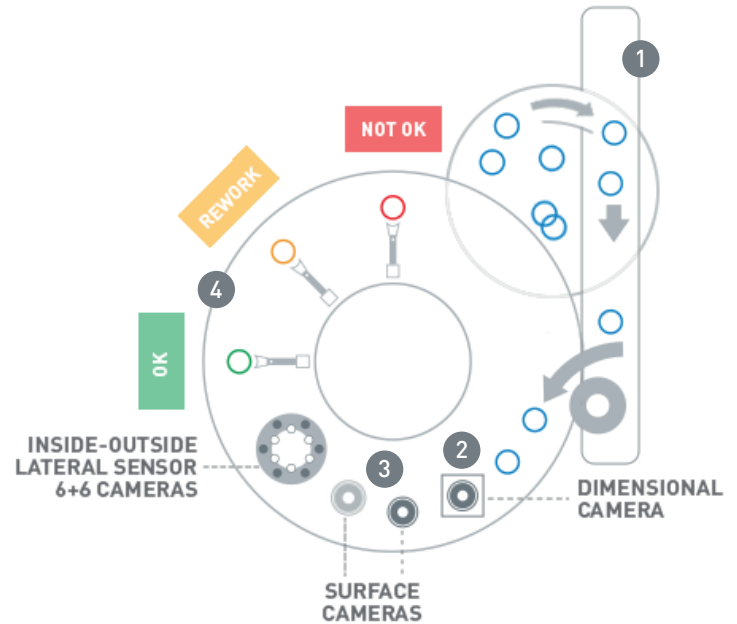
ARTIFICIAL  
INTELLIGENCE

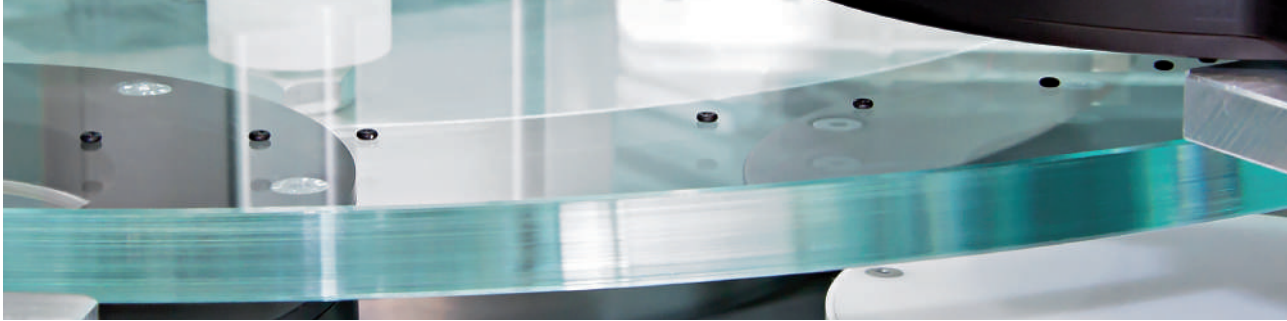
## ILLUMINATION

- Digital regulation of bright intensity for inside and outside surfaces
- Possibility to control piece with reflecting surface
- Good precision of dimensional and surface controls
- No decadence of bright intensity

## LASER THRUBEAM SENSOR

Laser thrubeam sensor is able to measure with extreme accuracy the planarity of the piece scanning its profile. It's possible to measure the height of pieces only if they are perfectly planar. The elevated precision of measuring is achieved using algorithms of elaboration of the signal that allow to eliminate any imperfection of the rotating table during its oscillation.





## DIMENSIONAL STATION

Independent measurement sensor for dimensional control of circular pieces, with the following characteristics:

- Progressive scan high resolution B/W camera
- Nearly zero distortion bi-telecentric lenses
- Dedicated lighting system

### Related control program features

- Measurement of the inner/outer diameter
- Measurement of the radial cross section
- Measurements of general lengths, angles, radii
- Flash defects inspection
- Nicks defects inspection
- Roundness inspection
- Center distance

## CONTROL SOFTWARE

The software for analysis and control of components with complex shape allows the recognition of planar rotation of piece. It also recognizes the top and bottom sides and independently processes the image of the piece regardless of load position.

### Control program

- Irregular profiles identification and related control with reference to the sample profile
- Control of the maximum and minimum height of holes and flash on linear and curvilinear profiles
- Definition of multiple calipers and control of their dimensions
- Control of the median and punctual variation of cord sections
- Simultaneous analysis of surface defectiveness in many inspection areas



## OPTIONAL CONTROL DEVICE OF EXTERNAL AND INTERNAL SURFACES

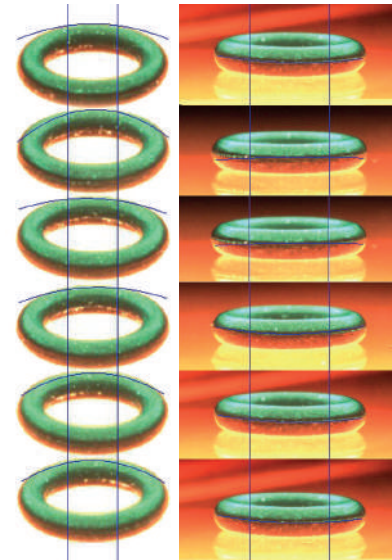
This system consists of two stations (internal side and external side) with each 6 progressive 2 Mpixel color scan cameras, with framing of the outside and inside of the piece every 60 °. Each camera has a very low distortion lens. In addition, the system is characterized by 2 levels of colored LED lighting arranged above and below the piece.

The system allows to optimize the illumination of the piece thanks to the independent regulation of the illuminators with pulsed light.

The control program allows you to detect defects on the external and internal edge of a piece and anomalies related to the mold closure and production defects that frequently occur in that area.

### Two stations: internal and external lateral surface

- 6+6 color camera
- Framing every 60°



## SPECIFICATIONS

TECHNICAL SPECIFICATIONS	7	12	20
Material	rubber, plastic, PTFE, metal		
Color	any color		
Min. External Diameter (mm)	1.2	1.8	2.5
Max. External Diameter (mm)	7	12	20
Min. thickness (mm)	0.26	0.26	0.50
Max. thickness (mm)	1	1	3
O-ring maximum thickness (mm)	-	-	6
Productivity	up to 10 pcs/s (36,000 pcs/h) depending on the typology and material of article		
Loading system	bowl feeder		
Antistatic bars	standard		

PLANARITY STATION	7	12	20
Height measurement range (mm)	9		
Dimensional resolution (mm)	0.001		
Accuracy of measurement (mm)	±0.015		
Repeatability of measurement ( $\pm 2\sigma$ ) (mm)	±0.025		

UPPER SURFACE STATION	7	12	20
Camera	full color		
Field of view (mm)	8.4x7	17x14	25x21
Dimensional resolution (mm)	0.001		
Optical resolution (mm/px)	0.035	0.068	0.010
Minimum detectable defect size (mm)	0.011x0.011	0.020x0.020	0.030x0.030
Focus adjustment	motorized	motorized	motorized

VERTICAL DIMENSIONAL STATION	7	12	20
Camera	B/W		
Field of view (mm)	8.4x7	16.7x13.3	Ø27.5
Maximum variation in pieces height (mm)	0.4	-	-
Generic pieces maximum height (mm)	-	0.75	0.75
O-ring maximum height (mm)	-	1.5	1.5
Dimensional resolution (mm)	0.001	0.001	0.001
Optical resolution (mm/px)	0.035	0.065	0.013
MPE inside diameter (mm)	0.009		
MPE outside diameter (mm)	0.009		

LOWER SURFACE STATION	7	12	20
Camera	full color		
Field of view (mm)	8.4x7	17x14	25x21
Dimensional resolution (mm)	0.001		
Optical resolution (mm/px)	0.035	0.068	0.010
Minimum detectable defect size (mm)	0.011x0.011	0.020x0.020	0.030x0.030
Focus adjustment	motorized	motorized	motorized

ABC (AUTOMATIC BLOWING CHECKER)	7	12	20
Control station blowing area of good pieces	standard		

## OPTIONALS

INTERNAL LATERAL STATION WITH 6 CAMERAS	7	12	20
Camera	full color		
Width of the field of view for each camera (mm)	20	20	33
Optical resolution (mm/px)	0.014	0.014	0.021
Minimum detectable defect size (mm)	0.040x0.040	0.040x0.040	0.065x0.065
Focus adjustment	motorized		

EXTERNAL LATERAL STATION WITH 6 CAMERAS	7	12	20
Camera	full color		
Width of the field of view for each camera (mm)	16	16	25
Optical resolution (mm/px)	0.010	0.010	0.016
Minimum detectable defect size (mm)	0.030x0.030	0.030x0.030	0.050x0.050
Focus adjustment	motorized		

ADDITIONAL LOADER	7	12	20
5L hopper	optional	optional	optional
15L hopper	n/a	optional	optional
Bulk feeder 100L	n/a	optional	optional

DEVICES
ABS (Automatic Blowing System)
DTC (Dirty Table Checker)
Laminar flow cabinet
Manual cleaning machine control
Rotating warehouse
Bagging machine
Z conveyor belt elevator

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