

SqueezeX

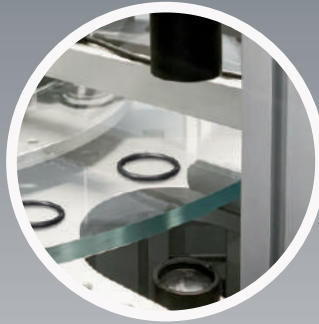
AUTOMATIC VISUAL INSPECTION MACHINE
WITH SINGLE TABLE FOR O-RING AND
TOROIDAL PIECES IN RUBBER

UTP VISION
VISUAL INSPECTION



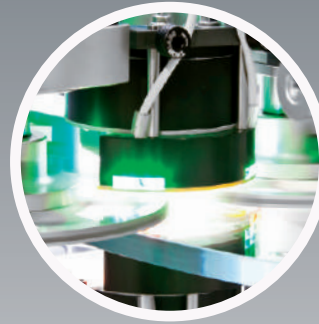
1

LOADING SYSTEM



2

DIMENSIONAL CAMERA



3

VIEW THROUGH SURFACE CAMERAS
(PATENTED TECHNOLOGY)



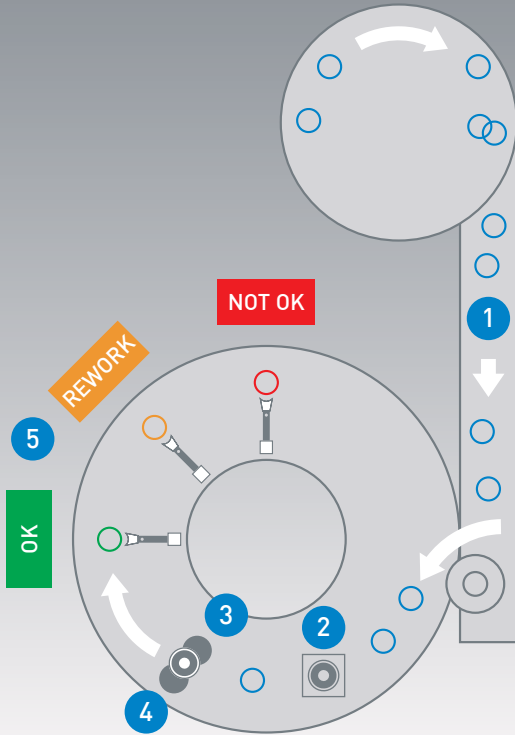
4

SQUEEZER STATION
(PATENTED TECHNOLOGY)



5

UNLOADING



LINUX



DATABASE
INTEGRATION



STATISTICS
REPORTS



PATENTED
COLOR VISION



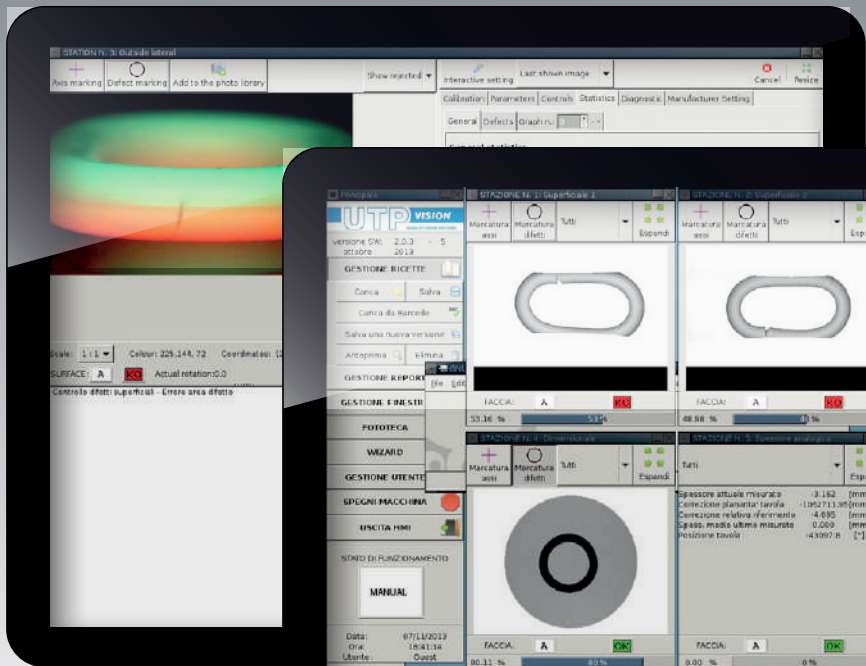
ARTIFICIAL
INTELLIGENCE

SqueezeX

SqueezeX is a visual inspection machine for the dimensional and surface control of o-rings and toroidal rubber pieces. It is able to find undetectable closed cuts and other critical defects such as cuts, flashes, voids, marks, stains, double-mouldings, out-of-roundness, out-of-concentricity, etc.

The production process of rubber articles can create cuts, mainly near the mould parting line, that are not visible to traditional vision systems.

SqueezeX solves the problem by means of two patented technologies: the **Squeezer station** deforms the piece while two cameras simultaneously image the top and bottom surfaces of the part (**View Through system**).





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.

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 THREBEAM SENSOR

Laser threbeam 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.



TELECENTRIC 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

TECHNICAL SPECIFICATIONS

MAIN FEATURES	20
Material	rubber
Color	any color
Min. outside diameter (mm)	3
Max. outside diameter (mm)	20
Min. thickness (mm)	1
Max. thickness (mm)	5
Productivity	up to 6 pcs/s depending on the different operating modes
Loading system	bowl feeder

PLANARITY STATION	20
Measuring range (mm)	9
Dimensional resolution (mm)	0.001
Accuracy of measurement (mm)	±0.015
Repeatability of measurement (±2σ) (mm)	±0.025

VERTICAL TELECENTRIC STATION	20
Camera	B/W
Field of view (mm)	Ø27.5
Generic pieces max. height (mm)	0.75
O-Ring max. height (mm)	1.5
Dimensional resolution (mm)	0.001
Optical resolution (mm)	0.013
MPE inside diameter (mm)	0.010
MPE outside diameter (mm)	0.009

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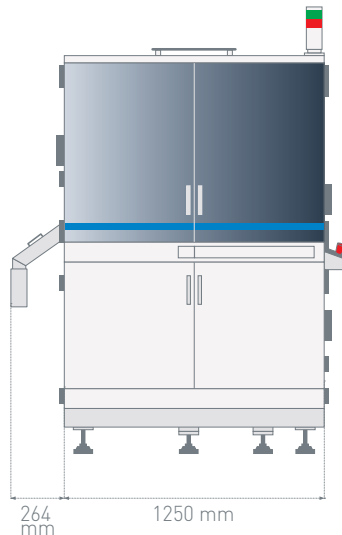
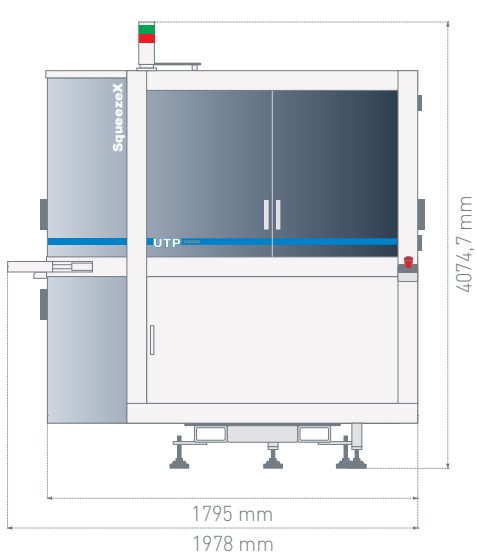
SQUEEZER STATION	20
Camera	B/W
Field of view (mm)	32x25
Max. external diameter (mm)	20
Min. external diameter (mm)	3
Min. thickness (mm)	1
Max. thickness (mm)	5
Dimensional resolution (mm)	0.001
Min. optical resolution (mm/px)	0.020
Minimum detectable defect size (mm)	0.060x0.060
Max. production in 1 shot mode	6 pcs/s
Max. production in 3 shots mode	3 pcs/s
Max. production in 10 shots mode	1 pcs/s

DEVICES	
Antistatic bars	ABC (Automatic Blowing Checker)

OPTIONALS

LATERAL STATION ON SQUEEZER	20
Camera	full color
Width of field of view (mm)	25
Optical resolution (mm/px)	0.020
Minimum detectable defect size (mm)	0.060x0.060

DEVICES	
5L hopper	Laminar flow cabinet
15L hopper	Manual cleaning machine control
Bulk feeder 100L	Rotating warehouse
DTC (Dirty Table Checker)	Packaging machine
ABS (Automatic Blowing System)	Z conveyor belt



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