CAP SORTER

FREE STANDING VISION SYSTEM FOR PRECISION INSPECTION OF PLASTIC CLOSURES

100% inspection and sorting of plastic closures up to 3000 pieces per minute

Cap Sorter includes:

- Vacuum Conveyor
- Spacer
- Vision System with Multi-camera assembly
- Touch Consol
- IO Control Interface
- Multi Blow Off

Features:

- Efficient
- Compact
- Precision Part Handling
- Precision Optics
- Precision Measurement
- Fully automatic Self Teaching Algorithm for Maximum Accuracy and Repeatability

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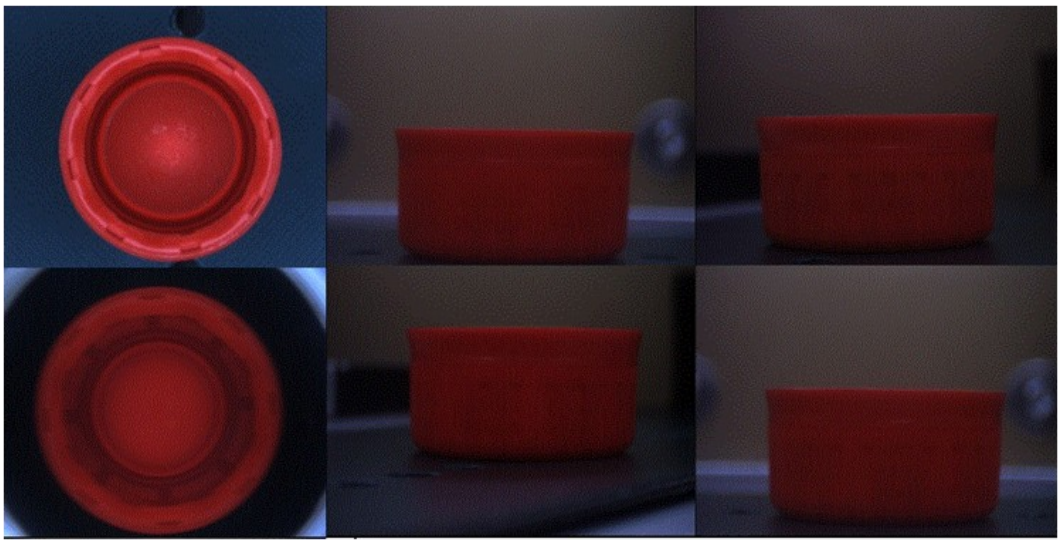
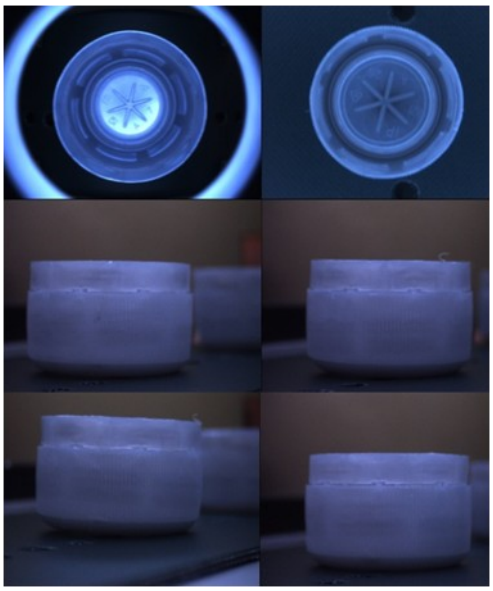
Operation

Caps need to be fed to the sorter oriented in single file.
The conveyor and spacing unit have adjustable speed control and are able to present the caps evenly spaced at 3000 pieces per minute.
The precision spacing unit and tracking system ensures that the parts are presented to the cameras within less than 0.5mm position variation in any direction, granting consistent inspection.
The caps are inspected by the camera system.
Bad parts are blown off the belt by the Solenoid controlled Reject Mechanism

High resolution All Surface Cap Inspection



2 x Overhead Camera
4 x Side Camera
Side & Internal Surface Inspection
External Dimension Testing



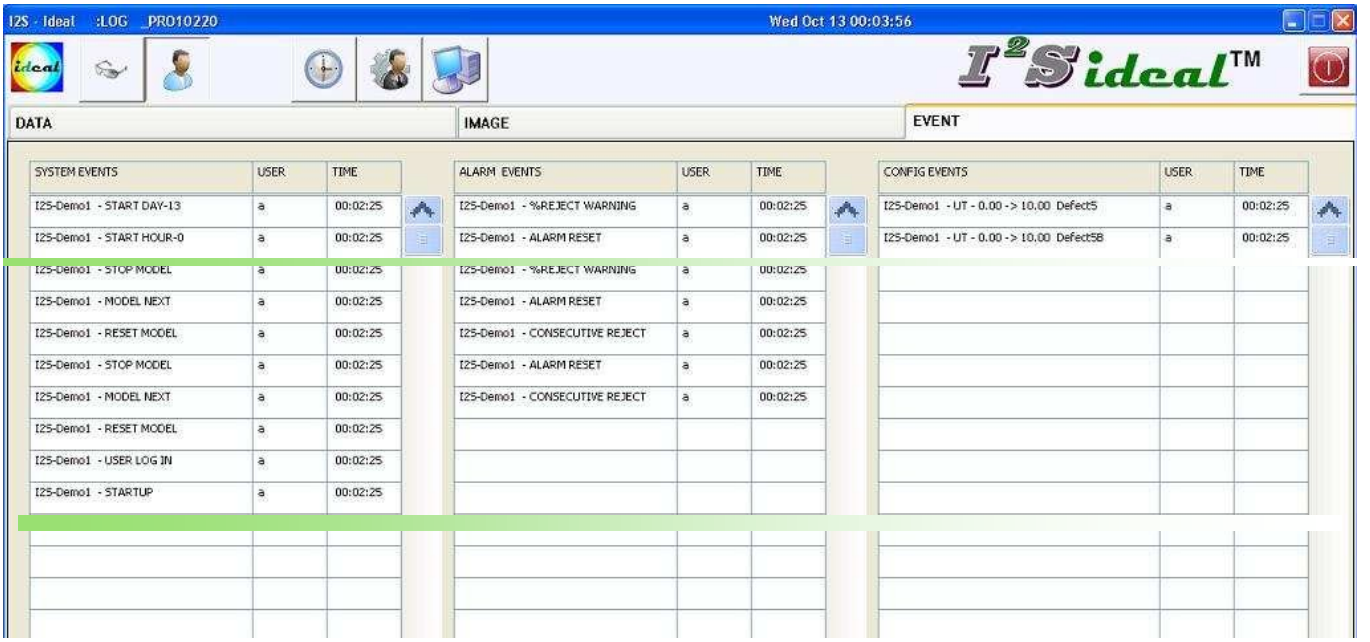
Data client

I2S- Ideal Data Client logs Data, Images and Events from a local server or a network (multiple servers).

The system logs Production Data by / Month / Day /Shift / Hour / Production Lot/ directly from servers.

User Interventions such as Model Resets, Setting Changes, Alarm Resets are all recorded by Date Time and User

Sample production images are also recorded by Lot Number



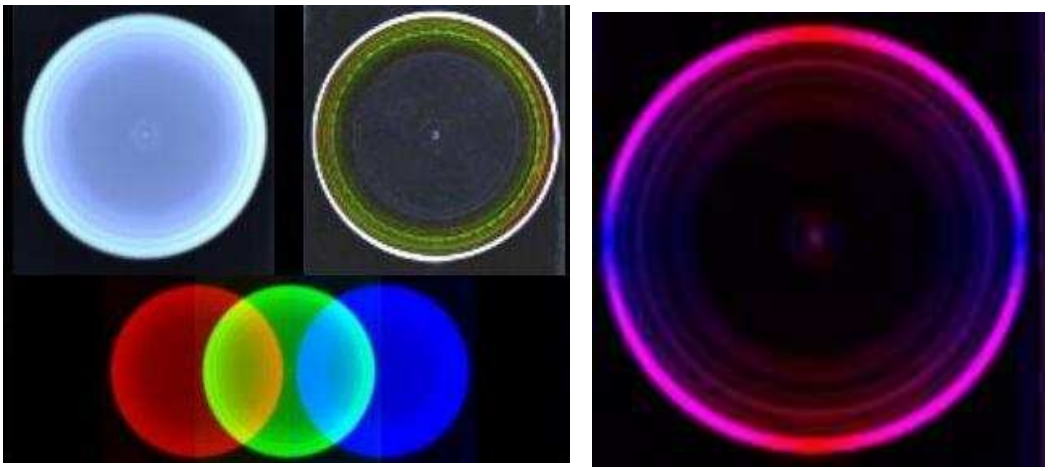
Vector Analysis

I2S Ideal Vector Analysis is a unique inspection algorithm which allows unskilled operators to AUTOMATICALLY SET system with the highest precision inspection capability.

The system creates an Ideal Vector Model using a sample set of good samples.

This models the natural variation of both colour intensity and gradient orientation features on the good parts.

Any feature which is not present in the model is detected as a defect.



Colour Intensity and Orientation Vector Model

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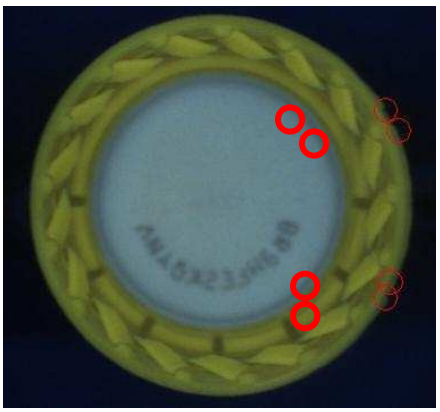
The model contains detailed information about the natural variance during production which means that the inspection is robust and stable with no false reject.
The vector model is able to detect tiny anomalies which do not occur naturally in a set of good samples.
If there are variations in material, which may occur in different production runs, it is simply a case of adding samples to the model to include these variations.

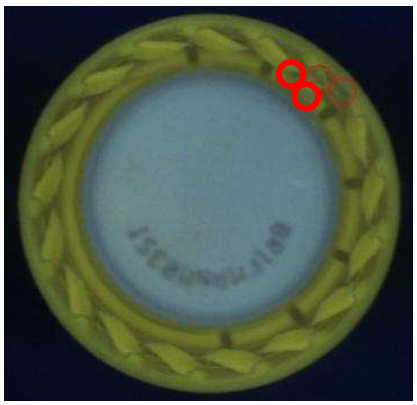
The user can define inspection zones based on the Vector Model allocating the zones with 3 different sensitivity levels.

These are general sensitivity levels which apply the same inspection capability to all zones on the same level. So there is no need to set sensitivity specifically for lots of different zones. The sensitivity level are intuitive and easy to set using simple slider bars

The key benefit of the Ideal Vector Analysis is the ability to detect anomalies on highly contoured surfaces, repeatedly detecting defects in areas that traditional vision systems cannot match.

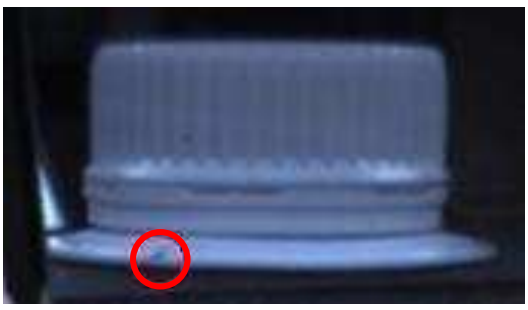


External flashing

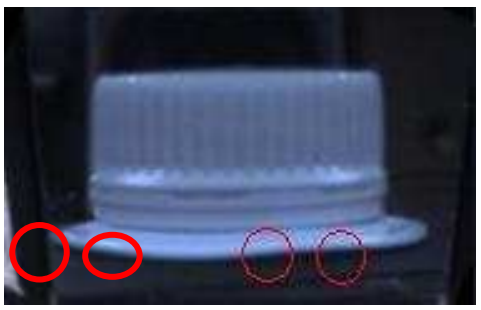


Missing Flag

liner flashing



Wavy Flange



Contamination

The above examples demonstrate the systems capability to detect defects on irregular Contours

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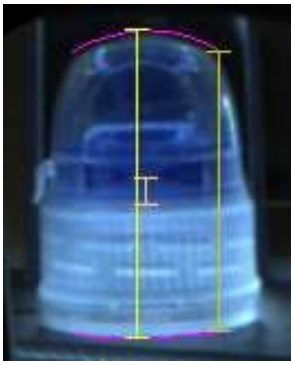
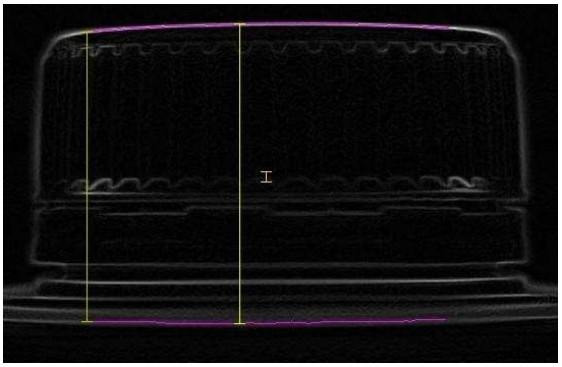
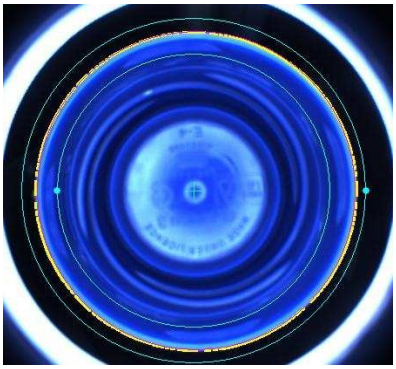
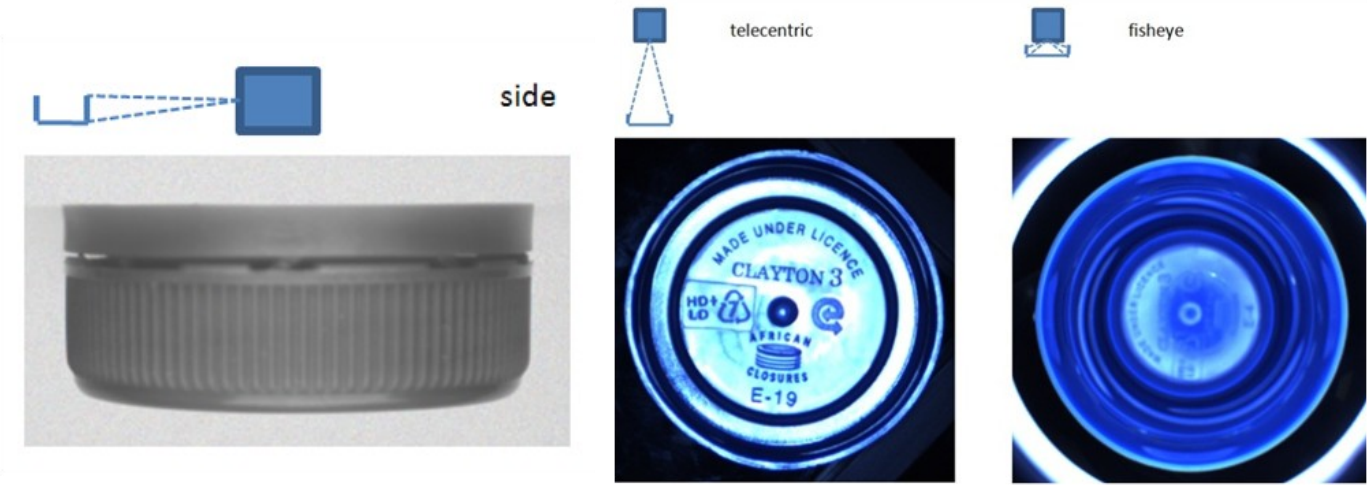
Precision Measurement

Multi point dimension test measures critical dimensions repeatably within <0.2 pixel
On 30mm closures this is approximately 20um

Imaging



Fish Eye overhead camera for inspection of Base Inner, Sidewall and Tamper Band Surface
Tele-centric overhead camera for dimension measurements
Side View multi camera for inspection of external side wall and tamper-band
Multi Camera also allows side dimension measurement
Therefore the multi camera provides extremely high capability for sorting of small vertical flashing and tamper band defects

GENERAL DETECTION SPECIFICATIONS
for all types of beverage closures

MOULDING DEFECTS > 200 um sq	
Horizontal Flashing	x
Vertical Flashing	X (50um)
Missing Flags	x
Smileys (lifted tamper band)	x(50um)
Deformation	x
Pulled Thread	x
Short Thread	x
Cracks	x
Contamination Internal	x
Contamination External	x(50um)
Colour Variation	x

LINER DEFECTS > 100 um sq	
Liner void (under-fill)	x
Liner flash (over-fill)	x
Clipped liner	x
Misplaced liner	x
Double Liner	x
Contamination	x

DIMENSION TESTING Accuracy +-25um	
Outer Diameter	x
Seal Diameter	x
Ovality	x
Height	x
Tamper Band (width)	x
Bulge (width)	x
Knurling (width)	X

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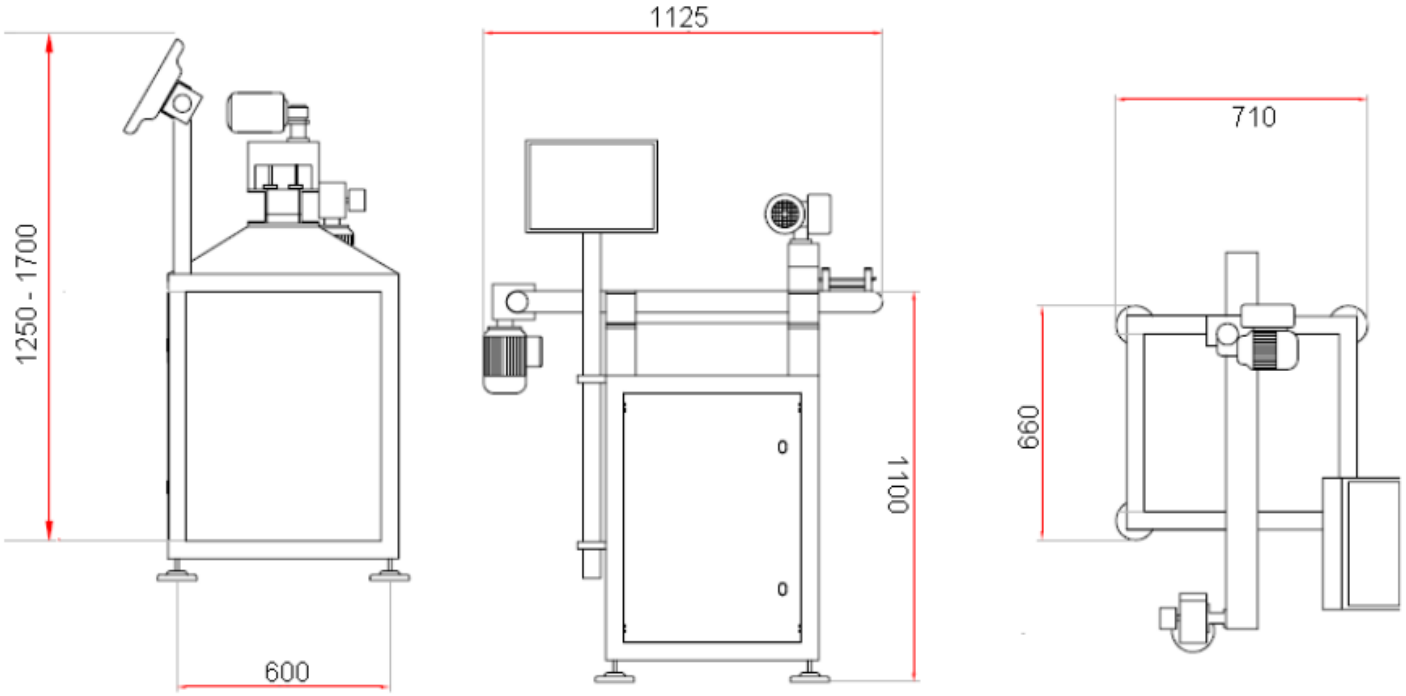
Specification Sheet

P.C.	I2S Industrial Intel i7 platform
Data Storage	Solid State (no Hard Drive)
O.S.	Win XP Embedded (no boot up)
Cameras	Digital I.E.E.E. 1394b
Illumination	Solid State Cool White
Rejection Mechanism	Blow Off solenoid
Maximum Inspection Speed	3000 pieces per minute

DIMENSIONS



- compact, efficient design
- small footprint
- low input power

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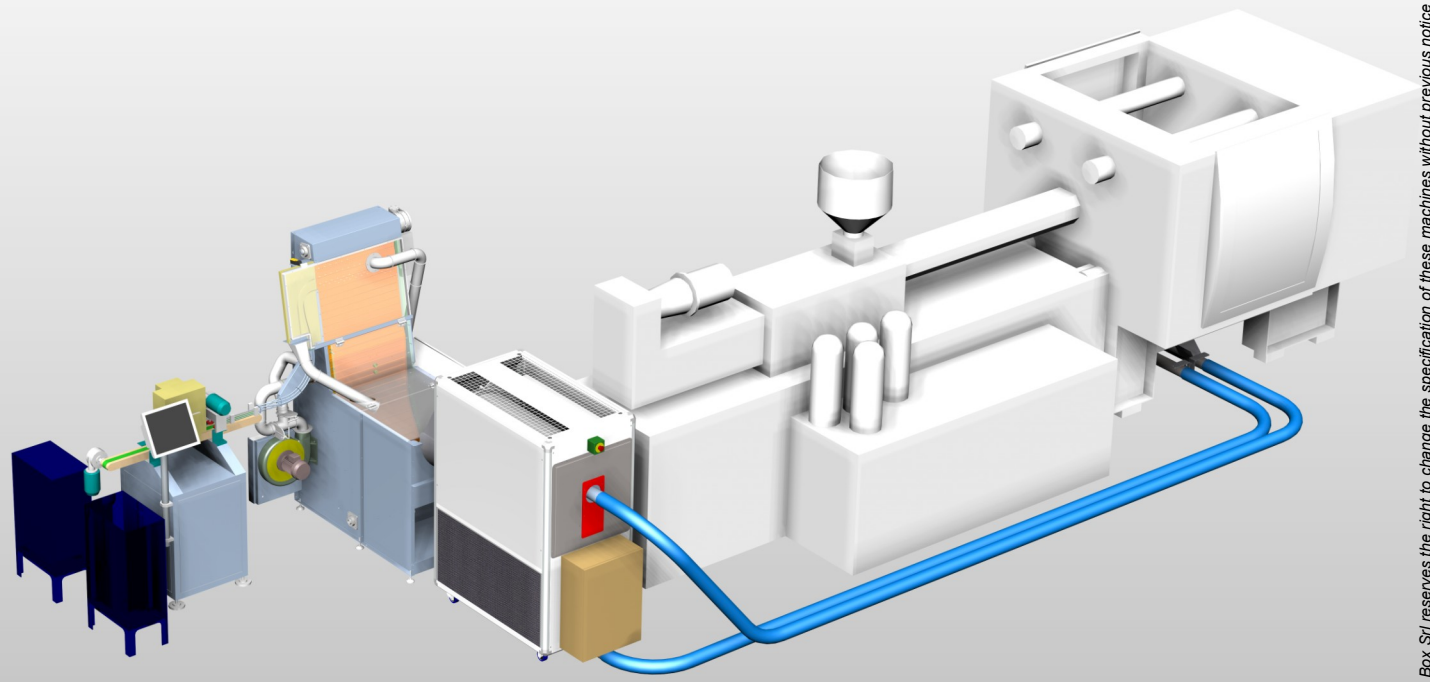
CAP SORTER is part of..

CAP TREATMENT

"Cap treatment" is a complete line of machines designed and manufactured to avoid any post-moulding problem.
The line consists of:

- Pneumatic transport of the caps to the Cap Cooler
- "Cap Cooler "cooling system
- Caps feeding system to the quality control unit
- Caps quality control which allows to detect and reject those pieces which do not correspond to the technical specifications.



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