

The Four Columns Of Industrial Vision

- DOT CODE 3D READER
- HIGH SPEED VIALS INSPECTION
- CAKE INSPECTION 2D-3D



**AUTOMATIC MACHINE
VISION
FOR
TOTAL QUALITY ON-LINE
INSPECTION**

Inspection Machines



2019

STORY



FM VISION SRL, is a company founded in 1997 by Ing. Augusto Falchetti Frescura, with the Vision becoming an important reference for automatic ON-LINE inspection with artificial vision systems in FOOD, BEVERAGE and PHARMA systems



Inspection Machines

EASY TO USE
INDUSTRIAL HW e SW
FLEXIBILITY
CUSTOMIZATIONS

FM VISION designs and builds machines for the Industrial Automatic On Line Inspection with relative ejection of the non_compliant products.



FM VISION GROUP

To better respond to the increasingly demanding market demands, and to ensure prompt and competent assistance to its customers, has created and is the head of a consortium of companies, each highly specialized in its sector, able to cover all needs from the feasibility study, to the design, to the production mechanical, electrical and startup



FMV group has about 30 specialized units able to operate all over the world

QUALITY SYSTEM

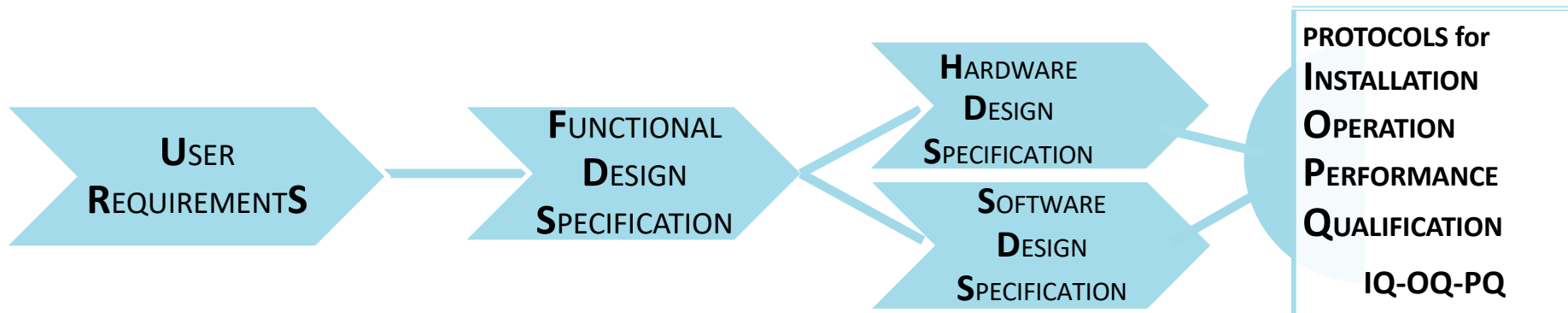
- Since 2013, FM VISION has been operating in all phases of the creation of its systems, from the feasibility study to on-line installation, according to the strictest criteria dictated by quality procedures.
- Appropriate control procedures make it possible to keep all processes carried out by the satellite companies of the group perfectly monitored.
- Strict Final Test Procedures allow us to guarantee a product that truly corresponds to the specific requests

FMVISION has within it staff entirely dedicated to the drafting of certification documents of all the systems produced.

 All Software is FDA COMPLIANT especially with CFR21 Part Eleven



Certificate No./ Certificato No.:
191779-2015-AQ-ITA-ACCREDIA



SECTORS

Inspection Machines

PHARMACEUTICAL



FOOD & BEVERAGE



AUTOMOTIVE



PHARMACEUTICAL



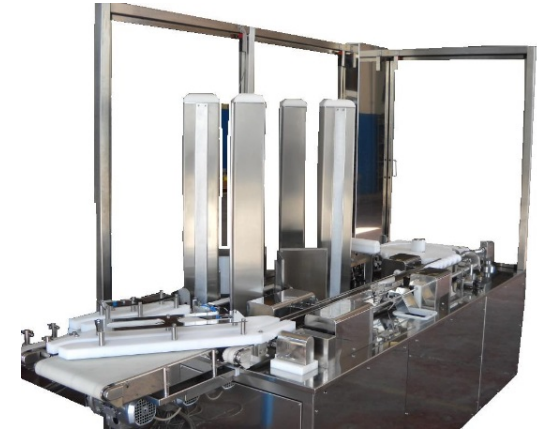
PIFV Full Powder Vials Inspection



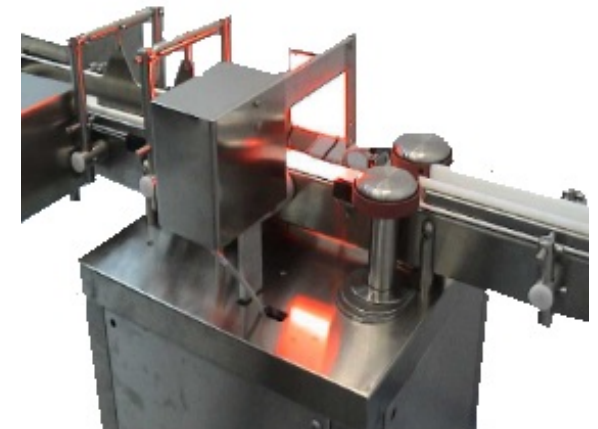
Print&Check for Plastic Containers



Serialization Print&Check Machine



PIEV Empty Glass Vials Inspection



PIS Pharma Stopper Inspection

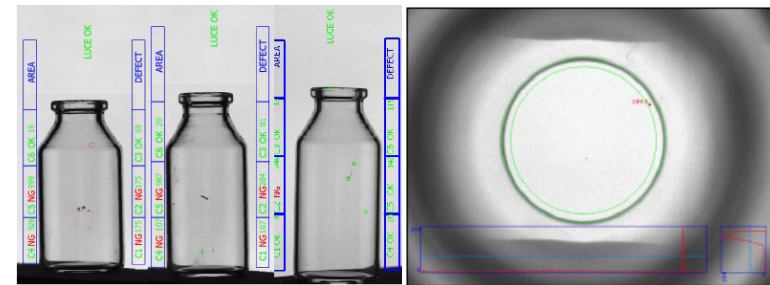
PHARMACEUTICAL



PIFV - Pharma Inspection Full Vials

- Speed: up to 400 Vials for minute
- Complete Glass Surface Inspection
- Complete Seal Inspection
- Flip Off Inspection
- Special Vibration System for Powder distribution
- Inspection Serialization with Database Data collection

PHARMACEUTICAL



PIEV - Pharma Inspection Empty Vials

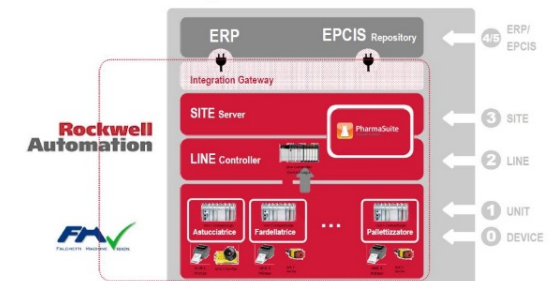
- Speed: up to 400 Vials for minute
- Complete Glass Surface Inspection
- Complete Seal Inspection
- Flip Off Inspection
- Special Vibration System for Powder distribution
- Inspection Serialization with Database Data collection

PHARMACEUTICAL

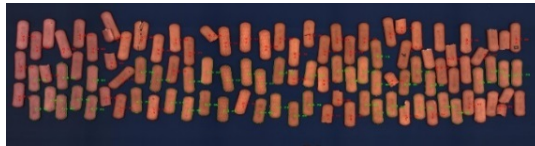


P&C - Pharma Serialization System

- Full Integrated with Pharmsuite Rockwell
- Label and Tamper Application
- Aggregation Module
- Weight Control Module
- Manual Serialization Module



FOOD & BEVERAGE



3D Biscuits Inspections



2D Biscuits Inspections



Weld Inspection

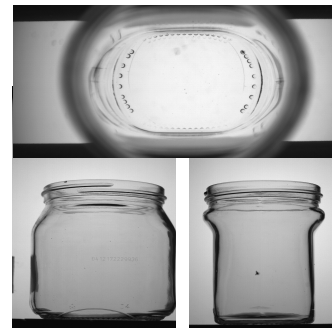


EGBI Empty glass Bottle Inspection



Level-Cap-Printed Code Inspection

FOOD & BEVERAGE



EGBI - Empty Glass Bottle Inspection

- Speed: up to 400 Bottle for minute
- Complete Glass Surface Inspection
- Container Rotation
- Easy Setup
- Special Progressive Ejection System
- Inspection Serialization with Database Data collection

AUTOMOTIVE



Ring Inspection



3D DOT CODE Tyre Reader System



Automotive Mirrors Inspection



Robot Coal Seals Measure System

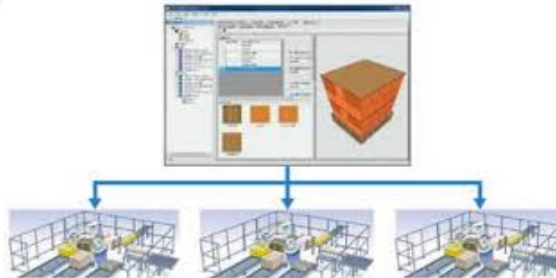


Automotive Components Inspection

SPECIAL LOGISTIC SYSTEM



Anthropomorphic Palletizing System



Pallet solver Software



AIV – Autonomous Intelligent Vehicle

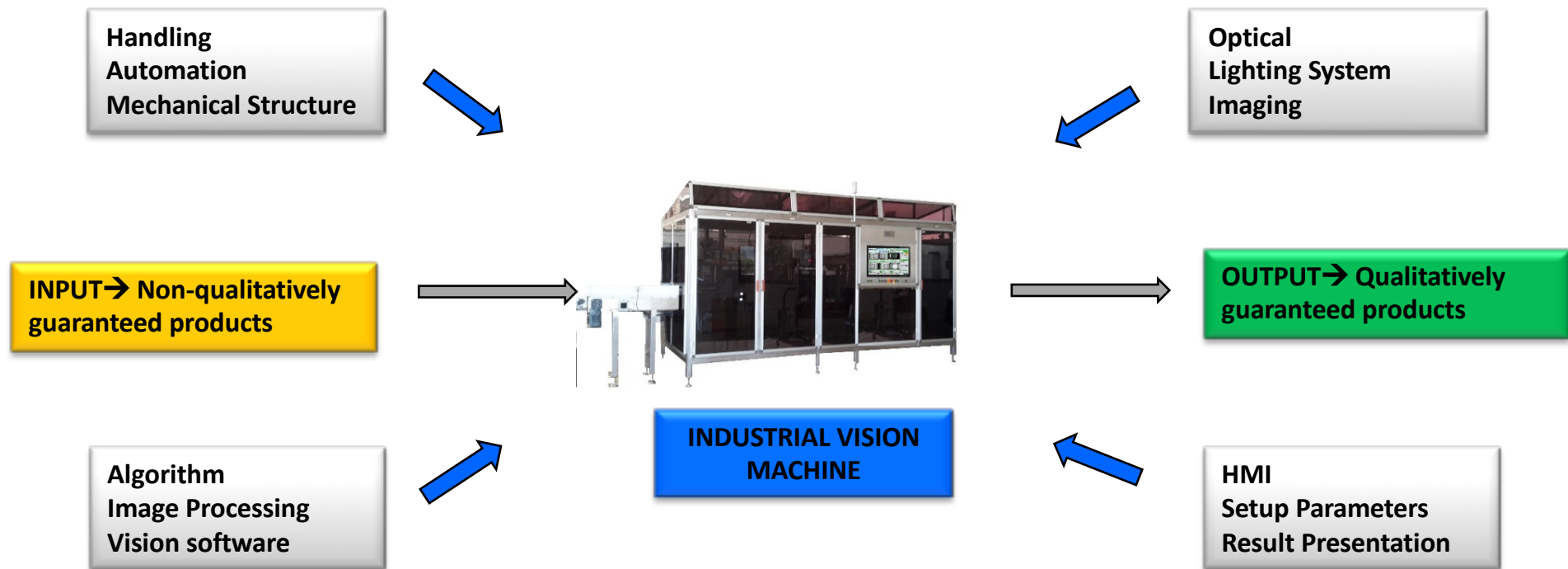


**Automatic Multipianar
LOADER/UNLOADER for AIV**

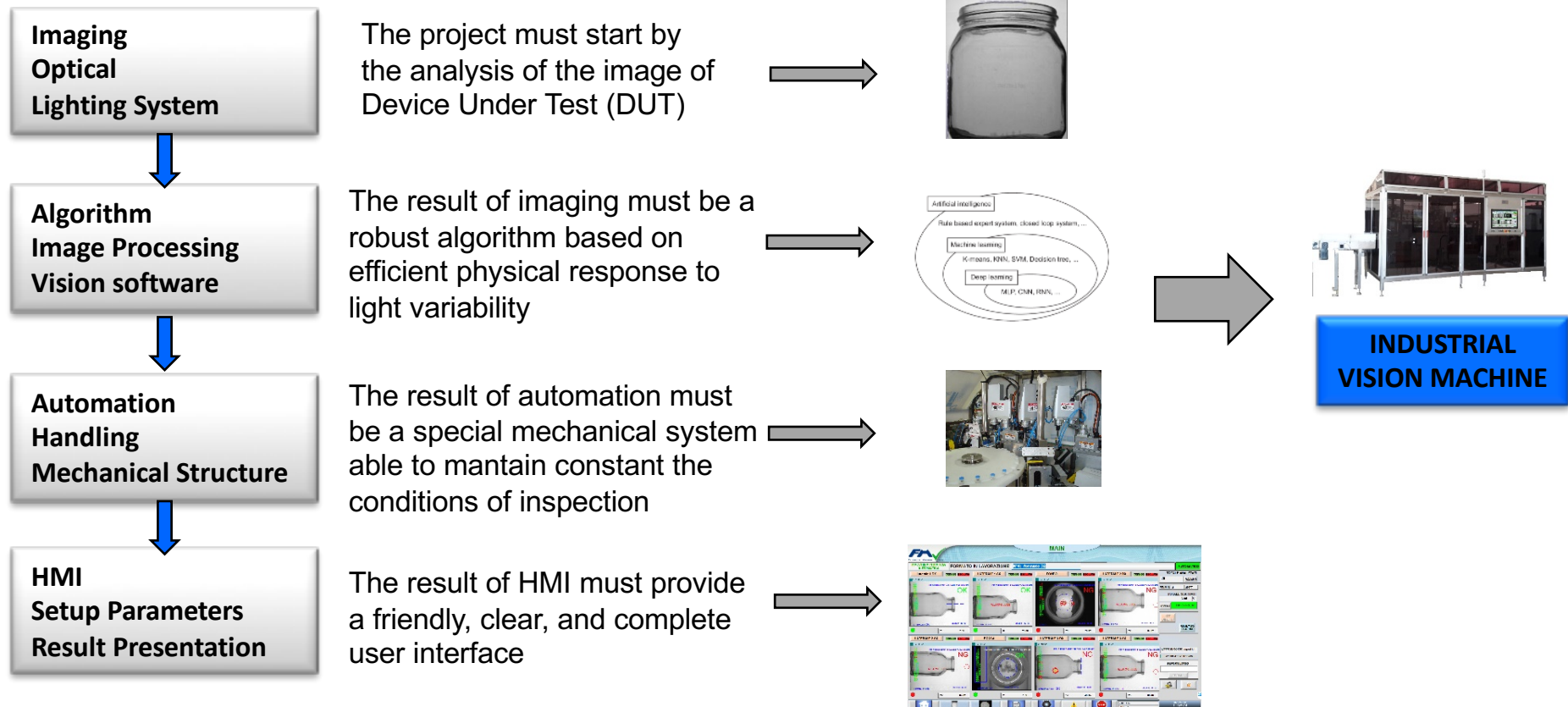
REFERENCES



The Four Columns Of Industrial Vision

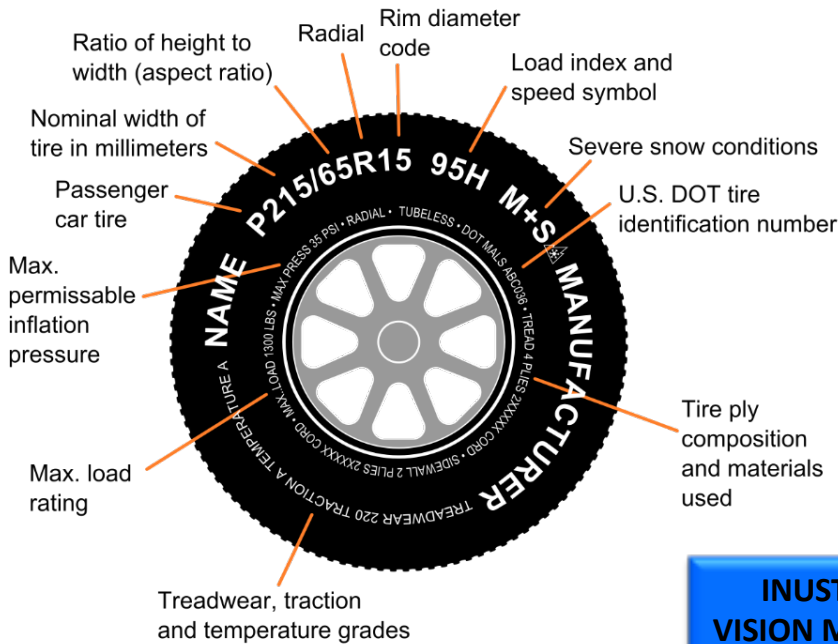


Priority on Project of Industrial Machine

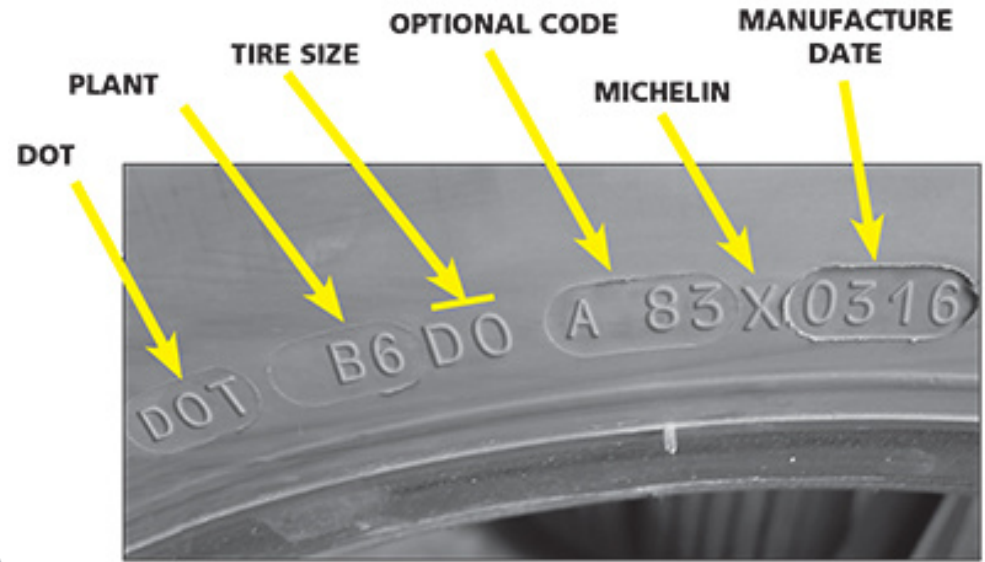


Example 1 Automotive Plant

DOT CODE Reading and Matrix Label Application



**INDUSTRIAL
VISION MACHINE**



DOT Code is also useful in identifying tires subject to product recall or at end of life

FCA

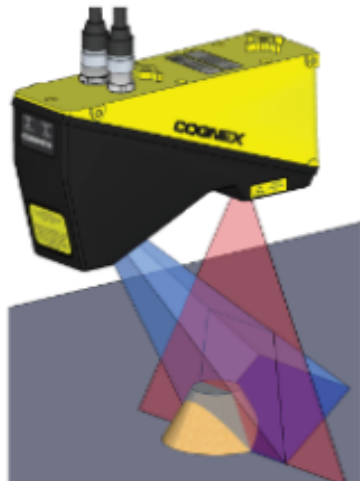


DOT CODE 01
DOT CODE 02
DOT CODE 03
DOT CODE 04

**USA
MARKET**

Example 1 Automotive Plant

DOT CODE Reading and Matrix Label Application



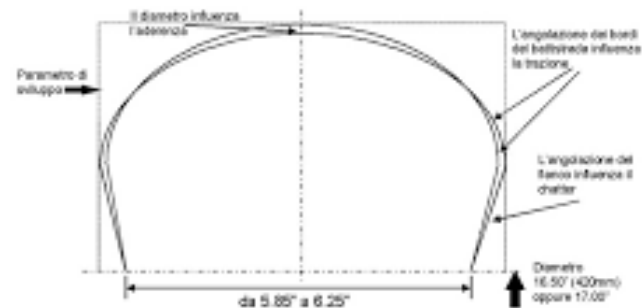
3D Concept



3D Image

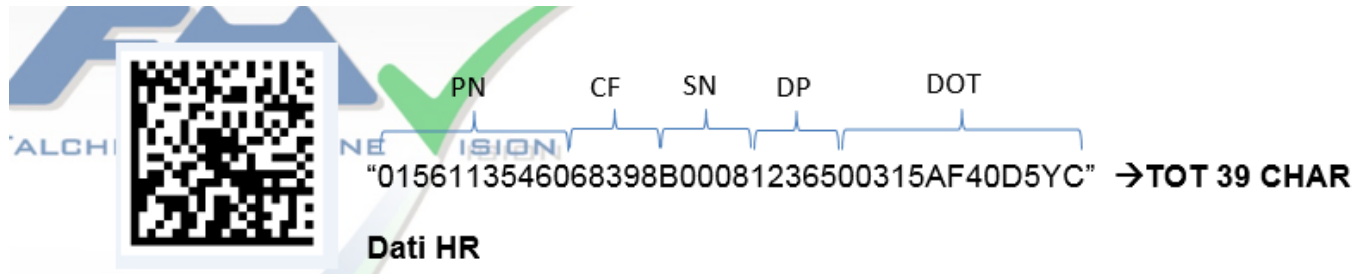
Independent from External Light Conditions

DOT Code reader must be able to extract characters from all kind of tyres, from all different profiles of background



Example 1 ^{3D Image} Automotive Plant

DOT CODE Reading and Matrix Label Application



**Different
Position**

**OCR to MATRIX
CODE**

**Matrix code is easily decodable from
Automotive Assembly Plant**

Example 1 Automotive Plant

DOT CODE Reading and Matrix Label Application



MAIN PAGE

MACCHINA IN AUTOMATICO | FORMATO IN LAVORAZIONE: 75 | MANUALE

ETHERNET OK | MOTION OK | EMERGENZE OK | DATABASE OK

PART NUMBER 01375363080 | IDC 118 | CodF 02651 | SUGGERISCI DOT 0B5JHU7DX | INSERISCI DATA SCADENZA

SN C3461 | DP 33919 | SCARTO

Pneumatico 1363491080 | Cerchio 1374083080 | Valvola 670106084

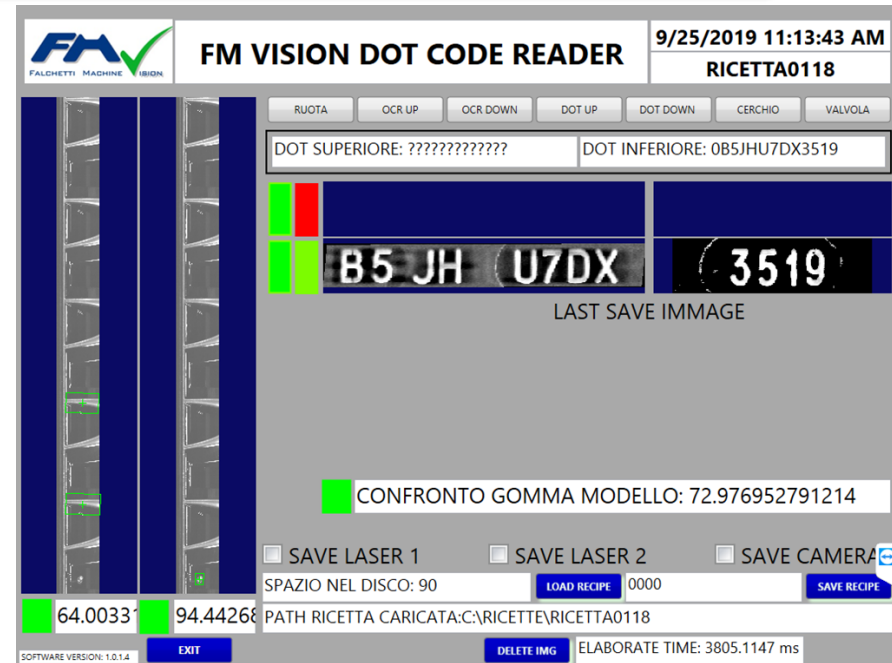
23 Mich. | TPMS_Schrader

DOT SUPERIORE ?????????????? | PNEUMATICO OK | CERCHIO OK | VALVOLA OK

DOT INFERIORE 0B5JHU7DX3519

POWERFUL HMI SOFTWARE

Every Tyre is Written in Special DB
and associated with Unique SSN
ZERO Tyre Without Matrix DOT
CODE is permitted



FM VISION DOT CODE READER | 9/25/2019 11:13:43 AM | RICETTA0118

RUOTA | OCR UP | OCR DOWN | DOT UP | DOT DOWN | CERCHIO | VALVOLA

DOT SUPERIORE: ?????????????? | DOT INFERIORE: 0B5JHU7DX3519

B5 JH U7DX | **3519**

LAST SAVE IMAGE

CONFRONTO GOMMA MODELLO: 72.976952791214

SAVE LASER 1 | SAVE LASER 2 | SAVE CAMERA

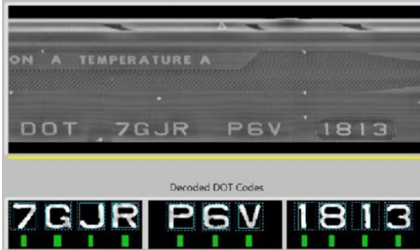
SPAZIO NEL DISCO: 90 | LOAD RECIPE 0000 | SAVE RECIPE

64.0033 | 94.44268 | PATH RICETTA CARICATA: C:\RICETTE\RICETTA0118

SOFTWARE VERSION: 1.01.4 | EXIT | DELETE IMG | ELABORATE TIME: 3805.1147 ms



01561135460
68398
B0008
12365



ON A TEMPERATURE A

DOT 7GJR P6V 1813

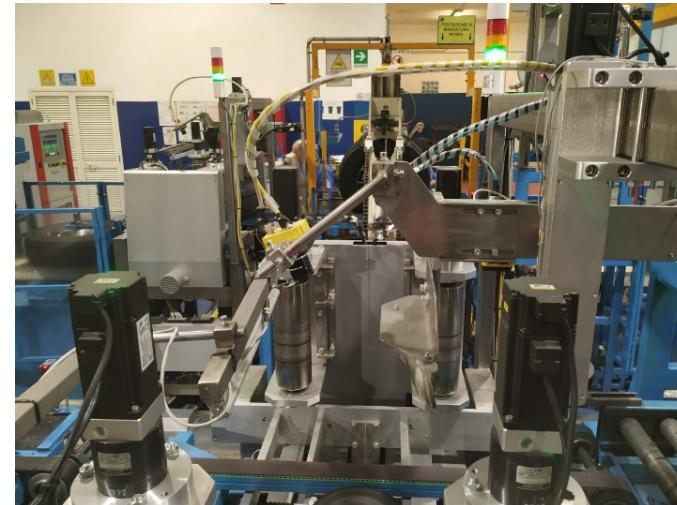
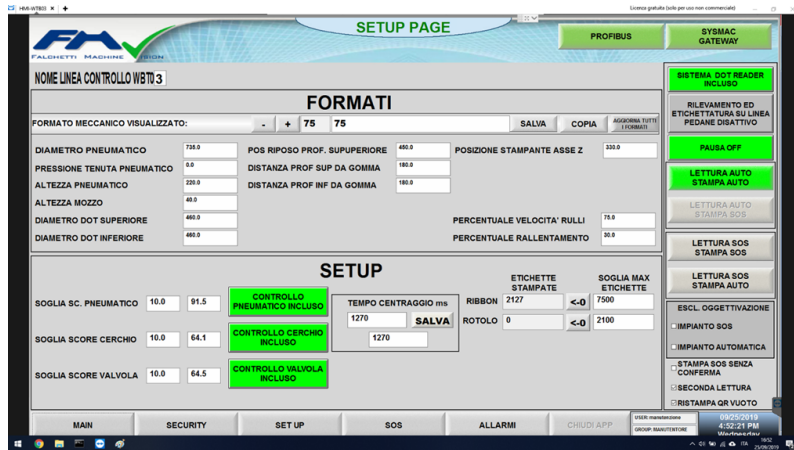
Decoded DOT Codes

7GJR P6V 1813

POWERFUL OCR SOFTWARE

Example 1 Automotive Plant

DOT CODE Reading and Matrix Label Application



**Full Brushless Motorized Size
change**

**Other Inspection Control
Integrated
Correct Assembly certified**

Example 1 Automotive Plant

DOT CODE Reading and Matrix Label Application



Video

Example 2 Pharmaceutical Plant

Glass Inspection Full Powder Vials High Speed (400pz/min)



FDA

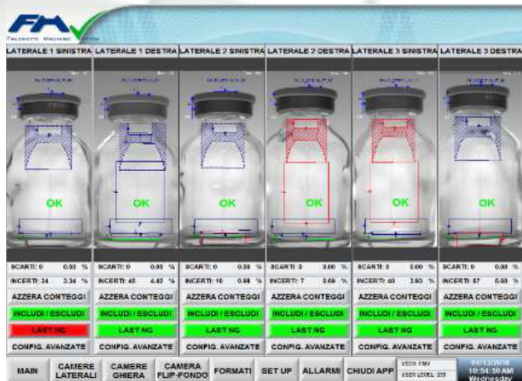


USA
MARKET



Difficult lighting
Irregular Product
High speed

**FULL SURFACE
COSMETICAL
INSPECTION**



Every single Vial is uniquely identified with a LOT ID
All inspection measures are registered in a Special DB

Example 2 Pharmaceutical Plant

Glass Inspection Full Powder Vials High Speed (400pz/min)

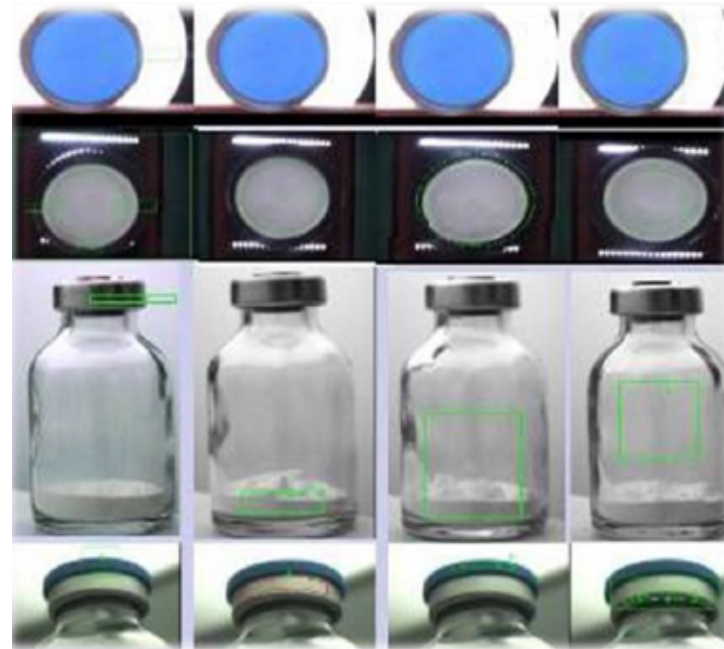
SPECIAL LIGHTING SYSTEM



LINEAR CAMERA



**SAME IMAGING
CONDITION FOR ALL
INSPECTIONS**



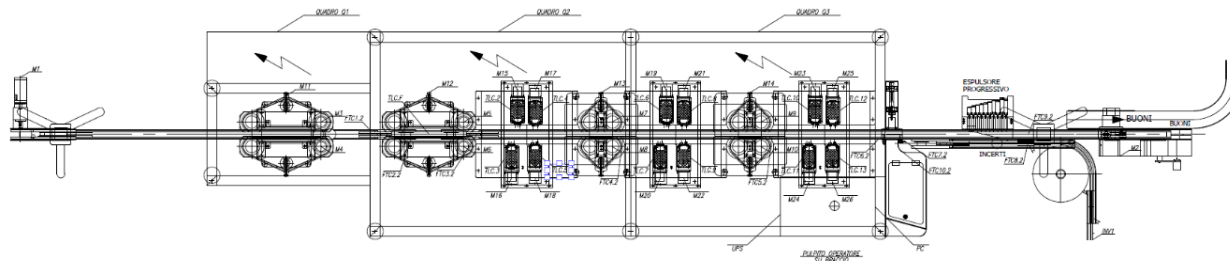
System have to Inspect all the Surface of vials

- Cap Seal**
- Flip Off**
- Lateral Sidewall**
- Bottom Sidewall**

**Example 2
Pharmaceutical Plant**

**Glass Inspection Full Powder
Vials High Speed (400pz/min)**

SPECIAL LINEAR CONCEPT



LINEAR SINGULARIZATION

FULL BRUSHLESS MOTORIZED 14 CAMERAS



**Human Inspection
20 Vials/min**

**Automatic
Inspection
330 Vials/min**

HIGH SPEED

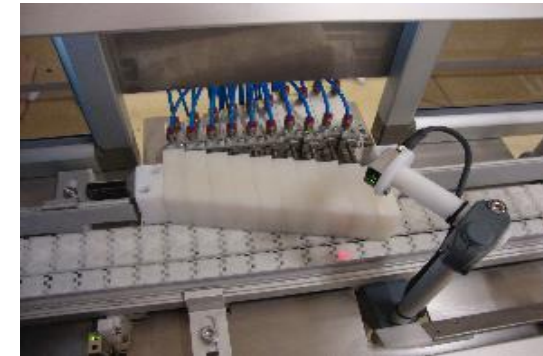


Example 2 Pharmaceutical Plant

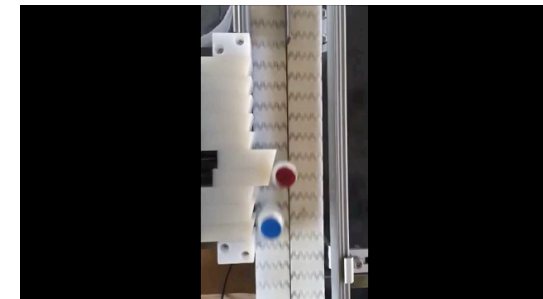
Glass Inspection Full Powder Vials High Speed (400pz/min)

HIGH GRADE OF AUTOMATION

**SPECIAL EJECTION FOR
VIALS CLASSIFICATION**



**PROGRESSIVE
EJECTION**



Example 2 Pharmaceutical Plant

Glass Inspection Full Powder Vials High Speed (400pz/min)

POWERFUL HMI

KNAPP TEST

The HMI interface displays a comprehensive overview of the glass inspection process. Key elements include:

- Machine Status:** 'MACCHINA IN STAND-BY' and 'FORMATO IN LAVORAZIONE: N°1: PROVA D26'.
- Production Data:** 'TOTALE ANALIZZATI: 27850', 'AZZERA: 112', 'TOTALE SCARTATI: 0.40%', and 'AZZERA: ESPALLORE NON ESCLUSO'.
- Camera Status:** Multiple 'CAMERANA' sections (1 SX, 1 DX, 2 DX, 3 SX) showing 'OFFLINE' status with associated counts and percentages.
- Inspection Results:** Visual representations of vials with 'INC', 'NOK', and 'OK' labels, indicating the outcome of the inspection.
- Job Details:** 'JOB IN USO: 1 job', 'MATERIA: 1001', and various parameters like 'VALORE LETTO' and 'LIMITE INCHIESTA'.
- Navigation:** A bottom menu with options like 'MAIN', 'CAMERE LATERALI', 'CAMERA GHIERA', 'CAMERA FLIP-FONDO', 'FORMATI', 'SET UP', 'ALLARMI', and 'CHIUDE APP'.

The 'KNAPP TEST' screen provides a detailed view of the test configuration and results:

- Test Configuration:** 'TEST KIT KNAPP', 'FORMATO IN CORSO PROVA: DX', 'RUN N.: 0', and 'PROGRESS KIT KNAPP'.
- Instructions:** '1-METTERE LA MACCHINA IN MARCIA AUTOMATICA' and '2-PASSARE I FLACONI NOK'.
- Test Parameters:** 'IDENTIFICATIVO TEST: screen', 'NUMERO FLACONI NOK: 2', and 'NUMERO FLACONI GOOD: 2'.
- Quality Factor Details:** A table showing 'DETTAGLIO FATTORE QUALITA' FLACONI KNAPP' with columns for individual vial results (01-36) and a 'PERCENTUALE FALSO SCARTO: 0%'.
- Control Buttons:** 'ANNULLA RUN', 'INTERROMPI KIT', 'TERMINA', 'CAMERE RISULTATO FLACONI', 'RISULTATO FLACONI', 'ALLARMI', and 'ESCI'.
- Footer:** 'USER: FBM', '10:01:22 AM', 'Tuesday', and '04/03/2018'.

HUMAN – MACHINE PERFORMANCE COMPARISON

**Example 2
Pharmaceutical Plant**

**Glass Inspection Full Powder
Vials High Speed (400pz/min)**

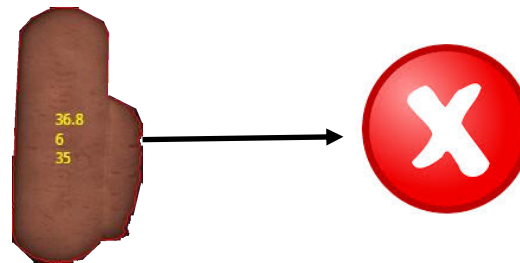
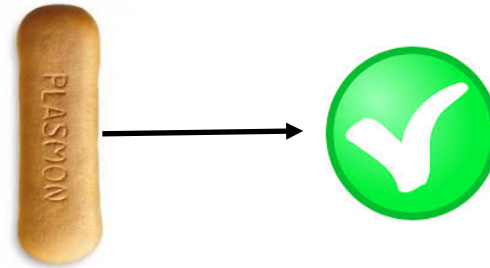


FM VISION PHARMA INSPECTION FULL VIALS

Video

Example 3 Food Plant

Cookies 2D/3D Full Surface inspection High Speed (200pz/sec)



2D Inspection

3D Inspection

WEB INSPECTION
TECNOLOGY

Example 3 Food Plant

**Modular Inspection
Project**

Cookies 2D/3D Full Surface inspection High Speed (200pz/sec)

**2D
version**

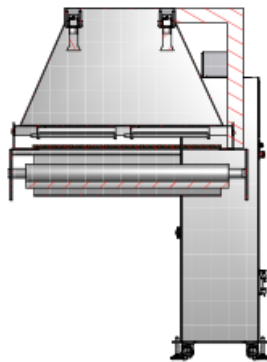


**2D+3D
version**



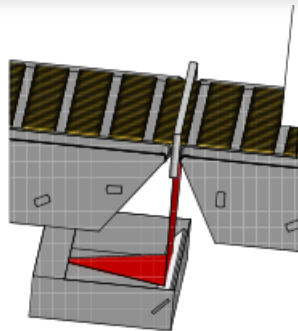
UPPER SIDE

STAZ 1



STAZIONE DI ISPEZIONE SUPERIORE
CON SISTEMA AUTOMATICO DI
CALIBRAZIONE

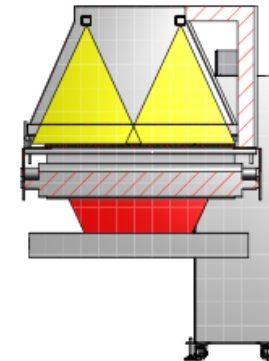
BOTTOM SIDE



RE STAZIONE DI ISPEZIONE INFERIORE CON
SPECCHIO AUTOPULENTE
E SISTEMA AUTOMATICO DI
CALIBRAZIONE CAMERA

**3D
MEASUREMENT**

STAZ 2



STAZIONE DI ISPEZIONE SUPERIORE
CON SISTEMA 3D
(CAMERA +LASER)

**Example 3
Food Plant**

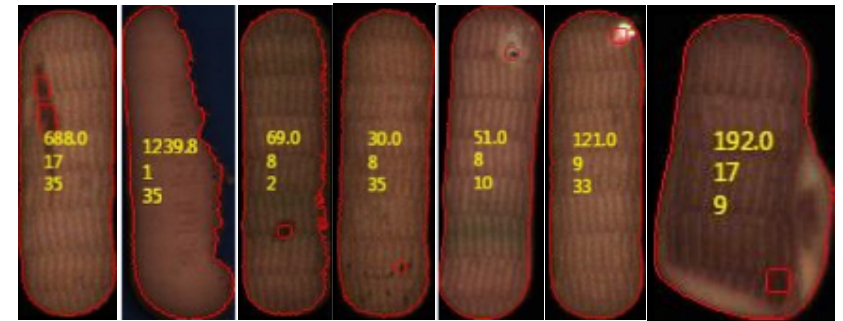
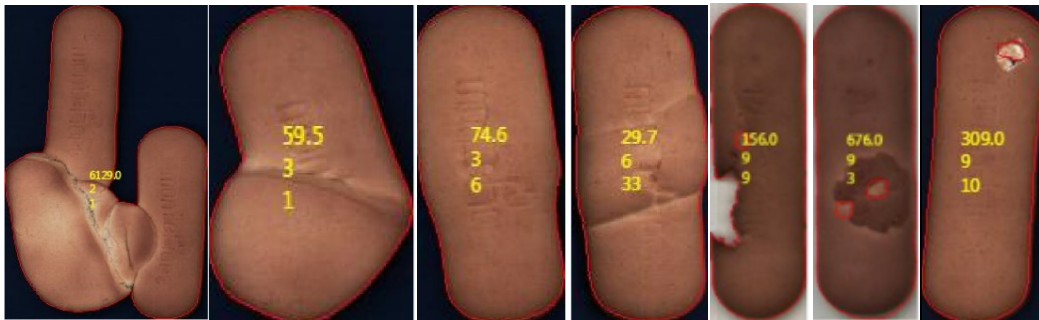
**Cookies 2D/3D Full Surface
inspection
High Speed (200pz/sec)**

**2D
version**



UPPER SIDE

BOTTOM SIDE



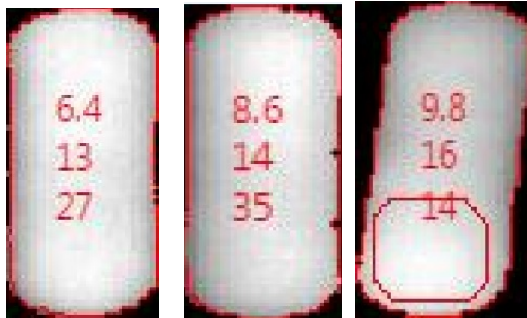
Upper Side

Lower Side

Example 3 Food Plant

Cookies 2D/3D Full Surface inspection High Speed (200pz/sec)

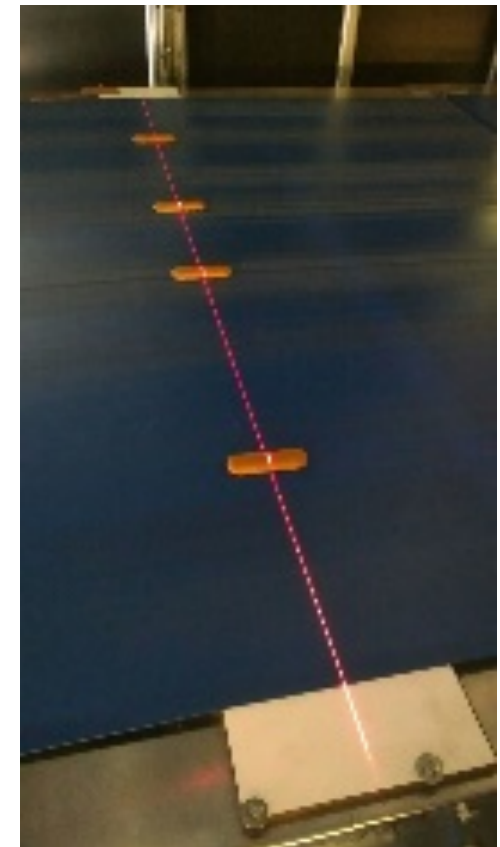
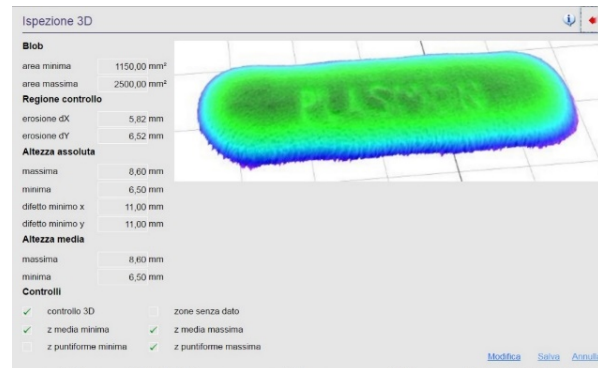
3D thickness measure



- Medium thickness
- Low thickness
- High thickness
- Local Low thickness
- Local High thickness

RESOLUTION UP TO 2 mm/10

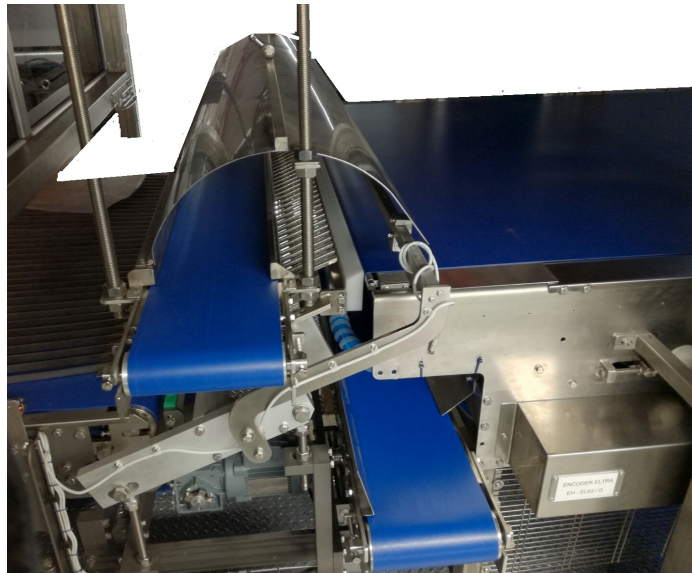
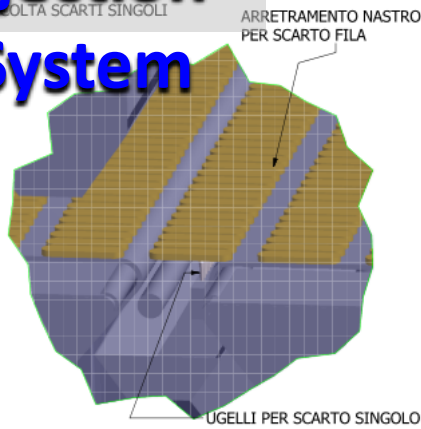
2D+3D version



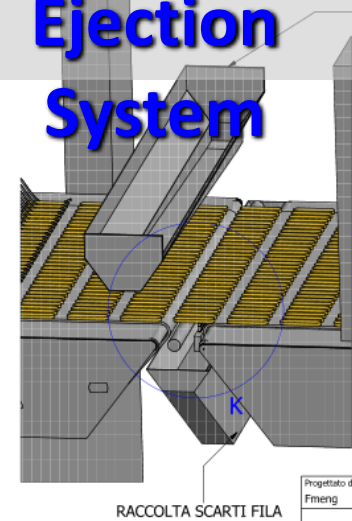
Example 3 Food Plant

Cookies 2D/3D Full Surface inspection High Speed (200pz/sec)

Full Line Ejection System



Single Piece Ejection System



DOUBLE EJECTION SYSTEM

FULL LINE or SINGLE PIECES EJECTION SYSTEMS

Example 3 Food Plant

Cookies 2D/3D Full Surface inspection High Speed (200pz/sec)

Ispezione 3D

Blob
 area minima 1150,00 mm²
 area massima 2500,00 mm²

Regione controllo
 erosioni dX 5,62 mm
 erosioni dY 6,52 mm

Altezza assoluta
 massima 8,60 mm
 minima 6,50 mm
 difetto minimo x 11,00 mm
 difetto minimo y 11,00 mm

Altezza media
 massima 8,60 mm
 minima 6,50 mm

Controlli
 controllo 3D
 z media minima
 z media massima
 z uniforme minima
 z uniforme massima

Home

17-11-2017 16:32 commessa n° Plasmonprimmesi-20171117-1

Plasmon primi mesi

Usciti totali: 68031558 Usciti analizzati: 3728056 Usciti commessa: 864300

Ispezione superiore

rodoto
 diametro 4800,00 mm
 spessore medio 84,00 mm
 spessore massimo 75,00 mm
 spessore minimo 27,00 mm
 spessore medio 23,00 mm

scarto superiore
 inclinazione 15,00 gradi
 inclinazione 49,00 gradi

vis. falcon
 x 1,00 mm
 y 1,00 mm
 contrasto 35

scarto inferiore
 inclinazione 55,00
 inclinazione 55,00

vis. falcon
 2D

scarto 3D
 vis. falcon

Punti bianchi
 difetto minimo x 1,50 mm
 difetto minimo y 1,50 mm
 contrasto 35

Macchie
 difetto minimo x 3,00 mm
 difetto minimo y 3,00 mm
 contrasto 20

offset delta: 0

Controlli:
 macchia
 direzione/verso
 punti bianchi
 area
 dimensione xy
 colore

Ispezione inferiore

Blob
 area massima 4800,00 mm²
 area minima 1400,00 mm²

Dimensioni prodotto
 lunghezza massima 84,00 mm
 lunghezza minima 75,00 mm
 larghezza massima 27,00 mm
 larghezza minima 23,00 mm

Angolo
 inclinazione 15,00 gradi
 inclinazione 49,00 gradi

Punti neri
 difetto minimo x 1,00 mm
 difetto minimo y 1,00 mm
 contrasto 25

Punti bianchi
 difetto minimo x 2,00 mm
 difetto minimo y 2,00 mm
 contrasto 35

Macchie
 difetto minimo x 2,00 mm
 difetto minimo y 2,00 mm
 contrasto 15

Deltae
 spessore massimo 57,00
 spessore minimo 39,00
 spessore massimo 57,00
 spessore minimo 39,00

Controlli
 controllo 2D
 angolo
 punti neri
 macchia
 direzione/verso
 punti bianchi
 area
 dimensione xy
 colore

Scarto Camera Superiore				Scarto Camera Inferiore				Scarto Camera 3D			
area mm	max	804	area mm	max	49	spessore medio massimo	3	spessore medio massimo	3	spessore assoluto massimo	3643
larghezza min	max	1	p. bianchi	max	20	spessore medio minimo	3	spessore medio minimo	3	spessore assoluto minimo	3643
larghezza max	max	3	macchia	max	1	spessore assoluto minimo	3	spessore assoluto minimo	3	spessore assoluto minimo	3643

Ispezione 3D

Controlli
 controllo regione 1
 controllo regione 2
 controllo regione 3
 controllo regione 4

EASY TO USE

POWERFUL HMI SETUP SOFTWARE & ADVANCED STATISTICS REPORT

**Example 3
Food Plant**

**Cookies 2D/3D Full Surface
inspection
High Speed (200pz/sec)**



Video



**FM VISION
THE Quality Control !**

Thanks