TEKNA

AUTOMAZIONE E CONTROLLO

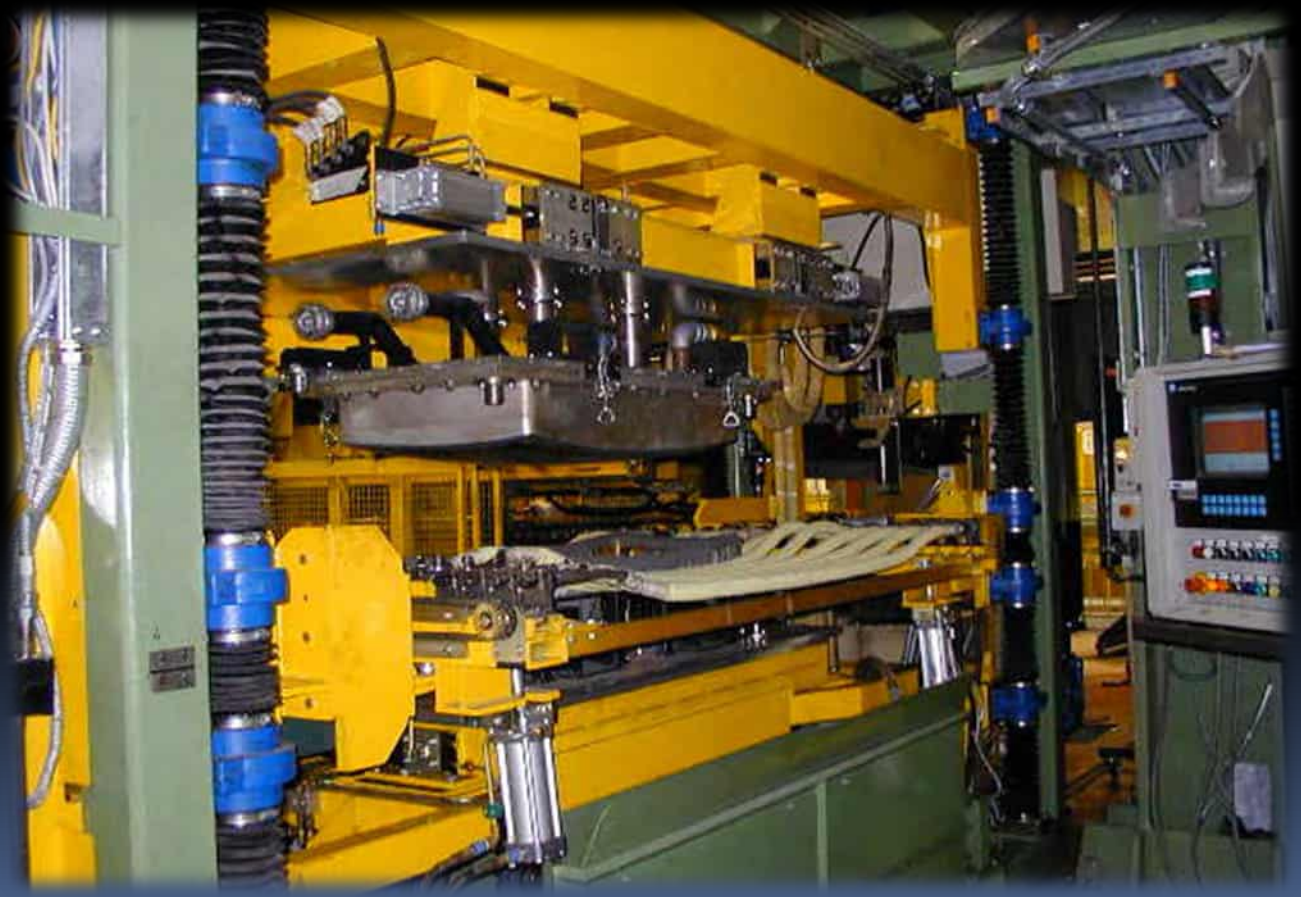
Experiences in Automotive sector

Tekna Automazione e Controllo works in the industrial automation field supplying products, systems and services for the automation and control of production lines.

Focusing on the automotive field, this presentation will show some of the automatic systems developed by Tekna, using its knowledge in handling different materials, robotics, vision systems, quality control and user friendly supervision systems.

AUTOMOTIVE GLASSES

Car Glass Bending Press



AUTOMOTIVE GLASSES

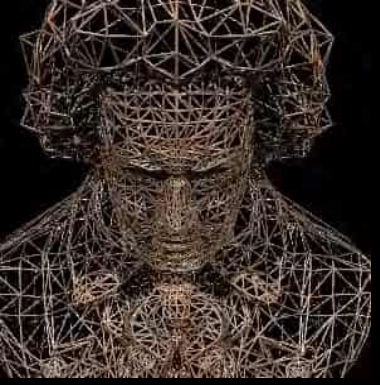
Tempering Furnace for Bent Glass

AUTOMOTIVE GLASSES

Automatic Glass Unload Line

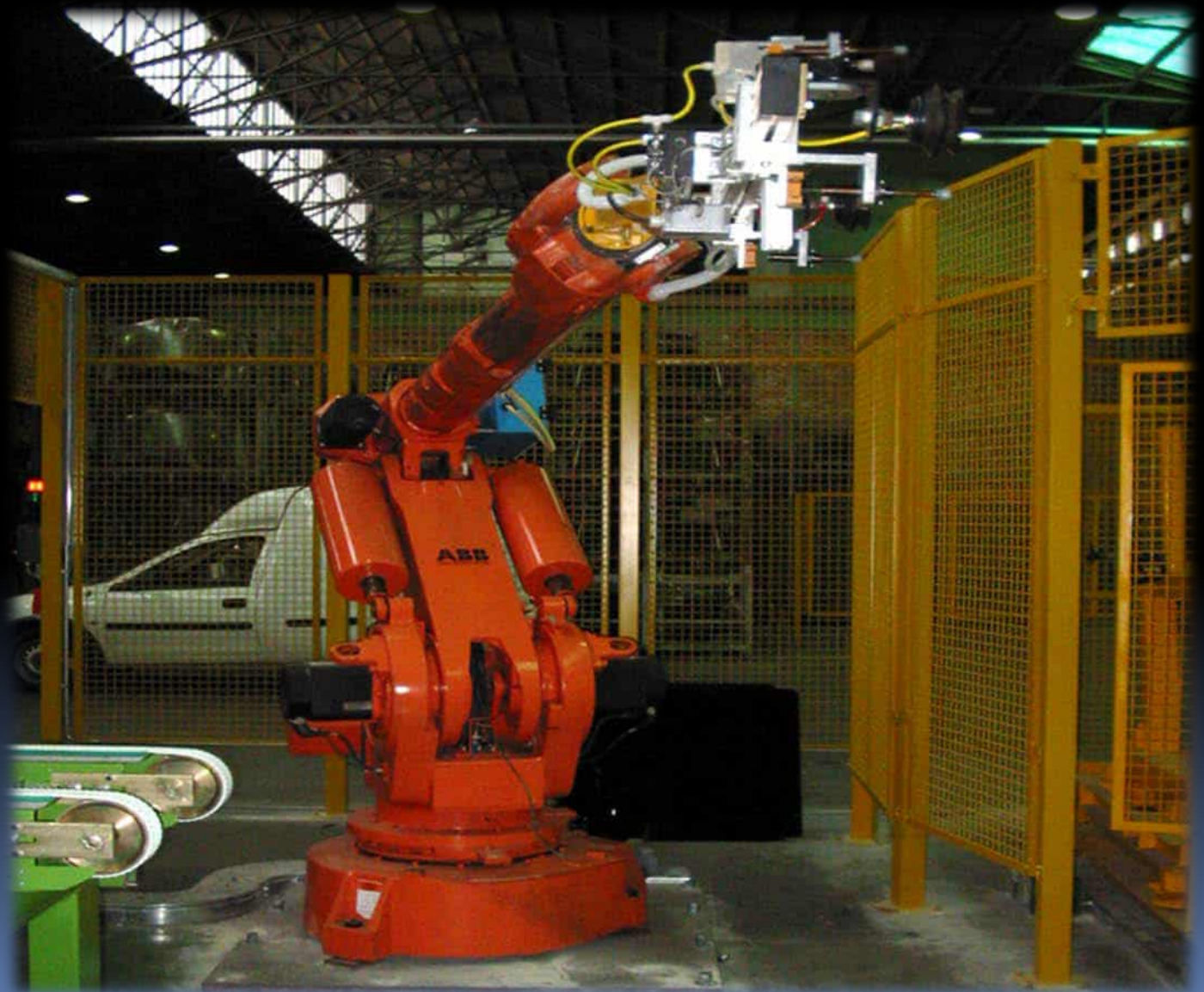
AUTOMOTIVE GLASSES

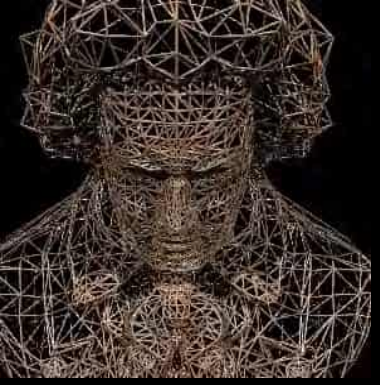
Control and Thermic Shock Station for Rear Window



ROBOTIC STATIONS

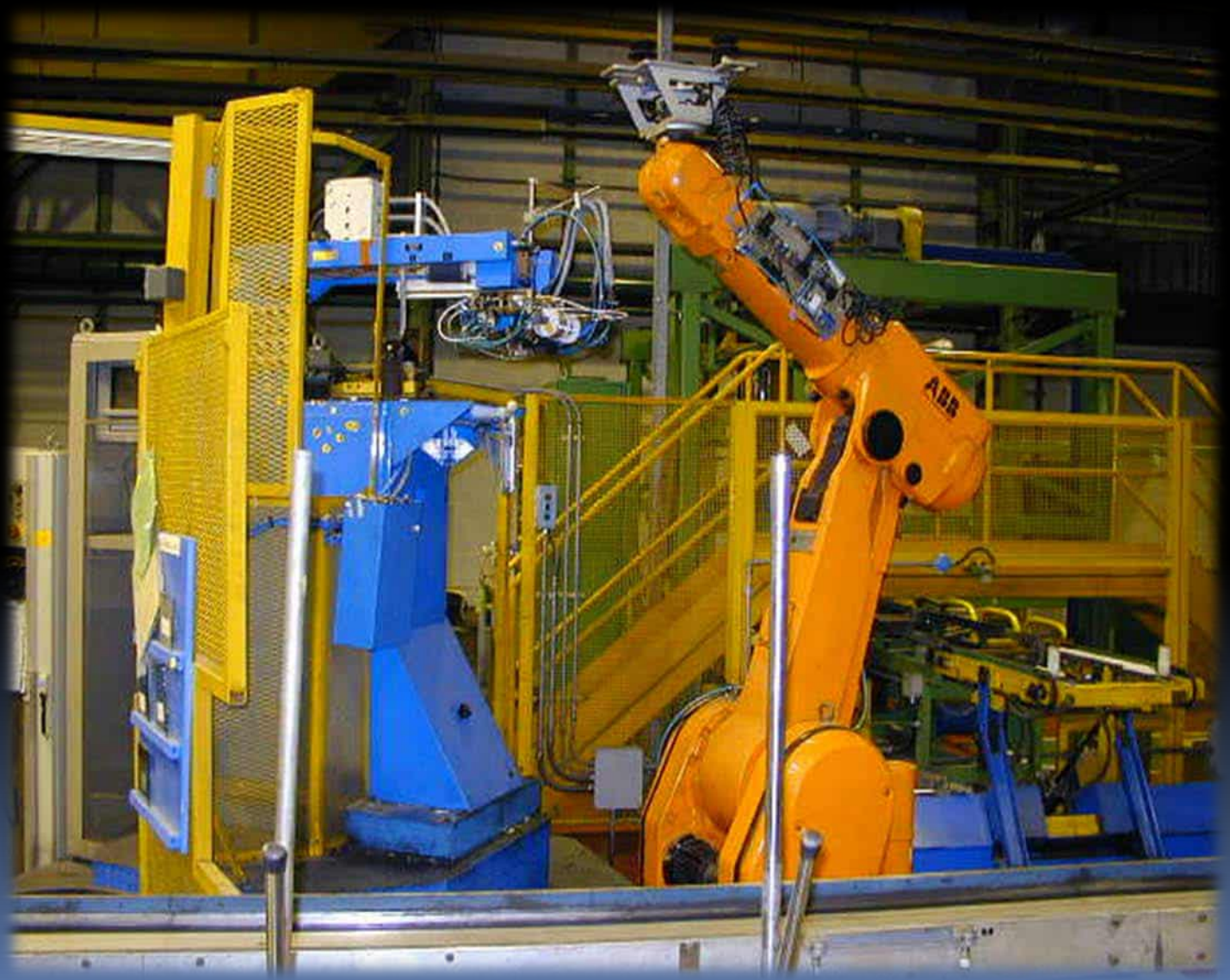
Automotive Glasses Loading





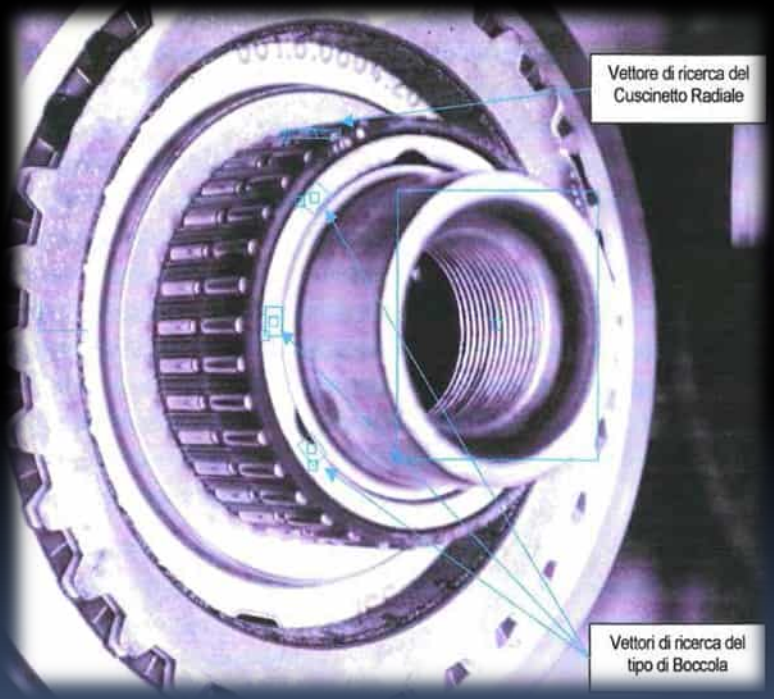
ROBOTIC STATIONS

Automotive Trimming Station



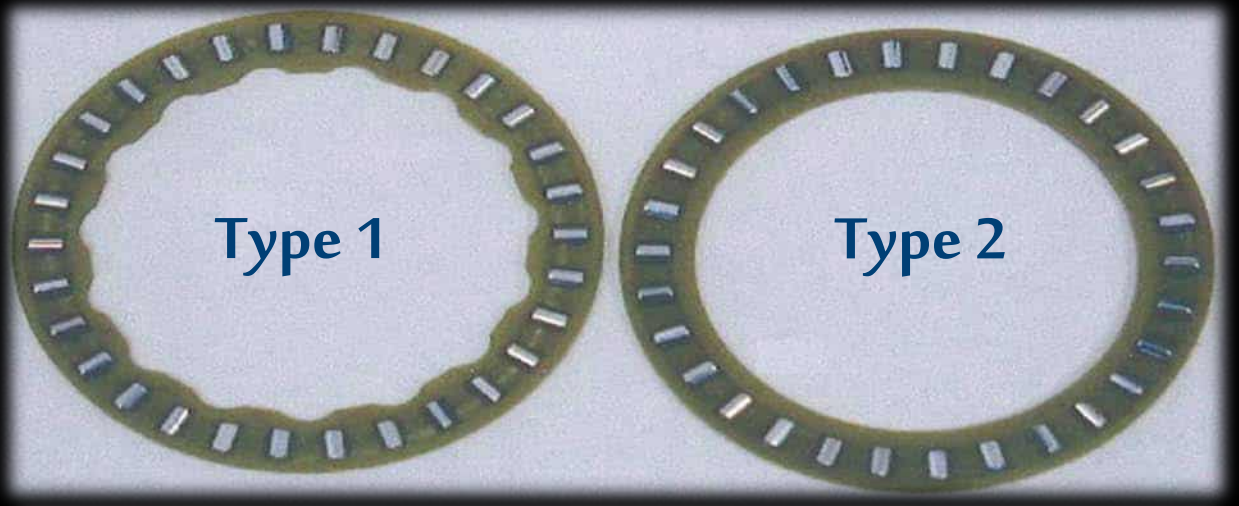
VISION SYSTEMS

Gear Change Assembly Control



VISION SYSTEMS

Gear Change Assembly Control



VISION SYSTEMS

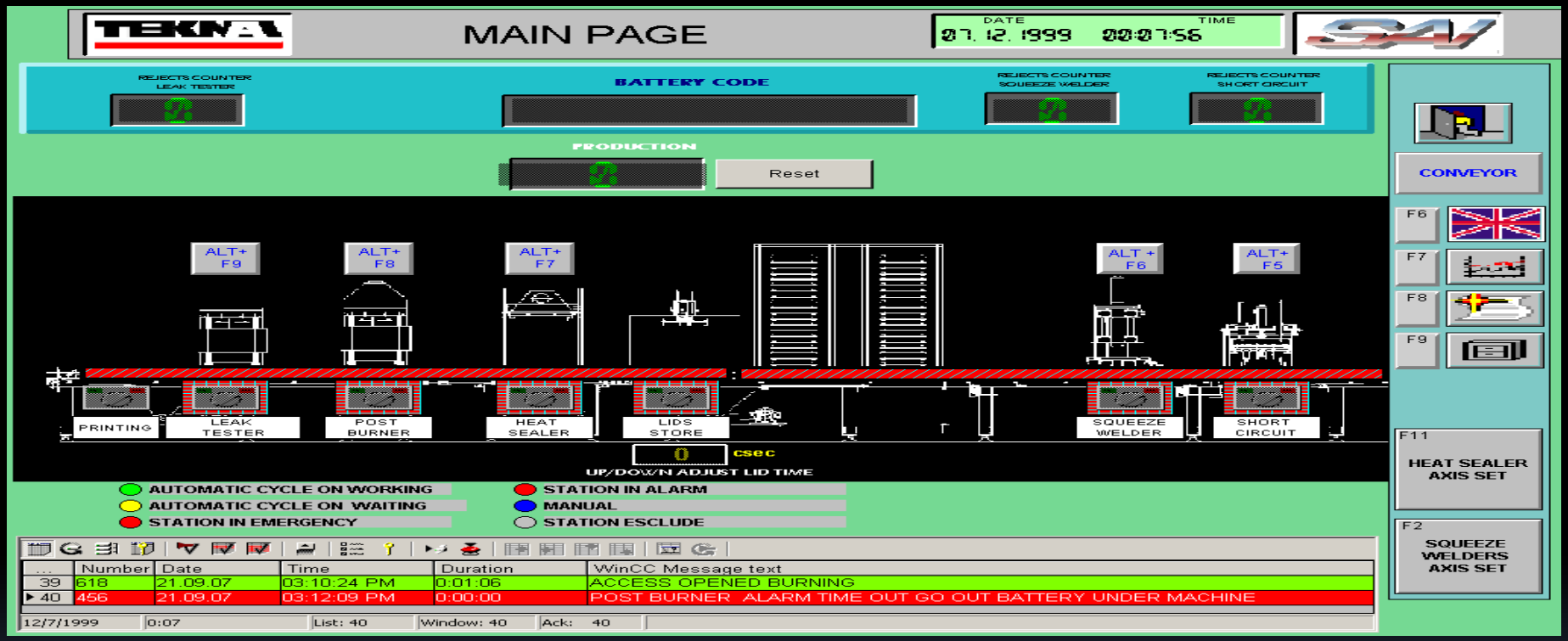
Synchronizer Assembly Control

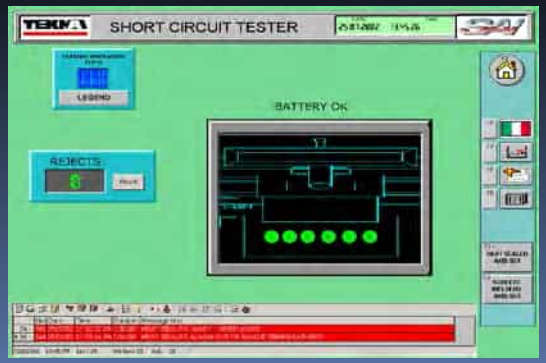
BATTERY ASSEMBLY LINES

Car Batteries Assembling and Testing

BATTERY ASSEMBLY LINES

Car Batteries Assembling and Testing





TIRE AUTOMATIC LINES

Rubber Raw Material Kneading

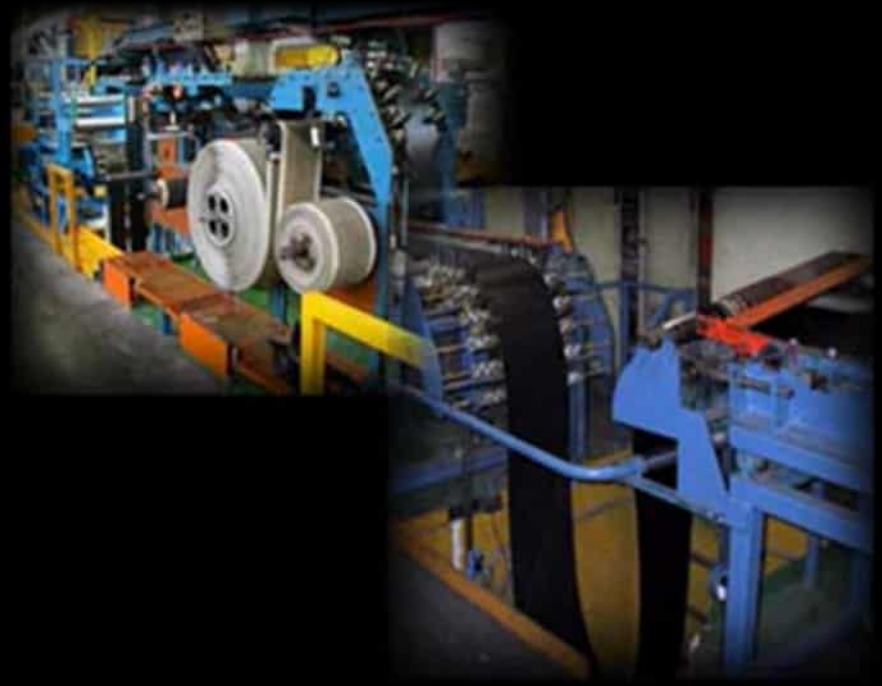
TIRE AUTOMATIC LINES

Rubber Raw Material Assembly

RUBBER MIXER HOMOGENIZATOR

DRIVE: D.C. DCS520 - ABB

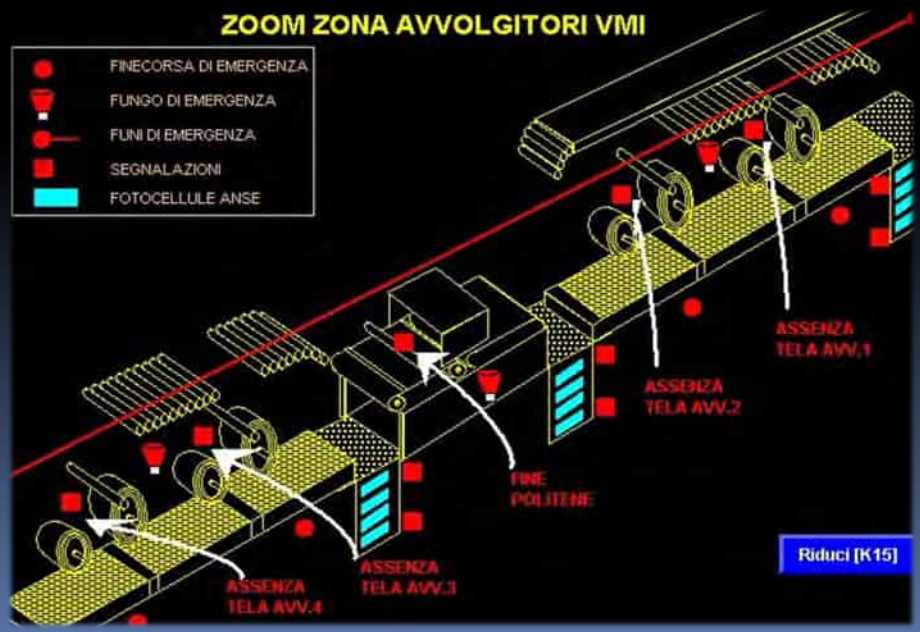
EMERGENCY: Class 4 GuardMaster - Rockwell

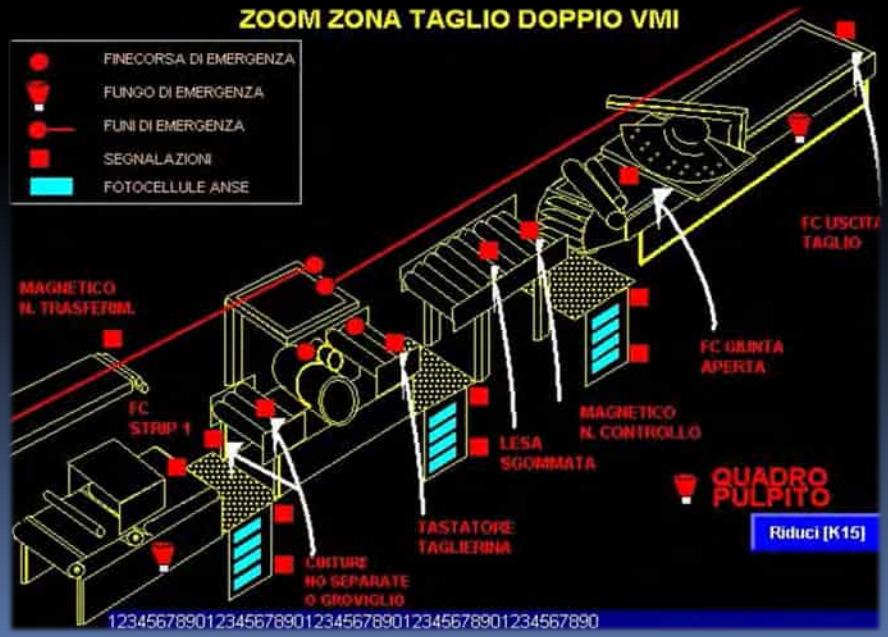


WINDERS
STRETCH CONTROL AND DANCER MANAGEMENT

TIRE AUTOMATIC LINES

Tire Band Assembly Line





TIRE AUTOMATIC LINES

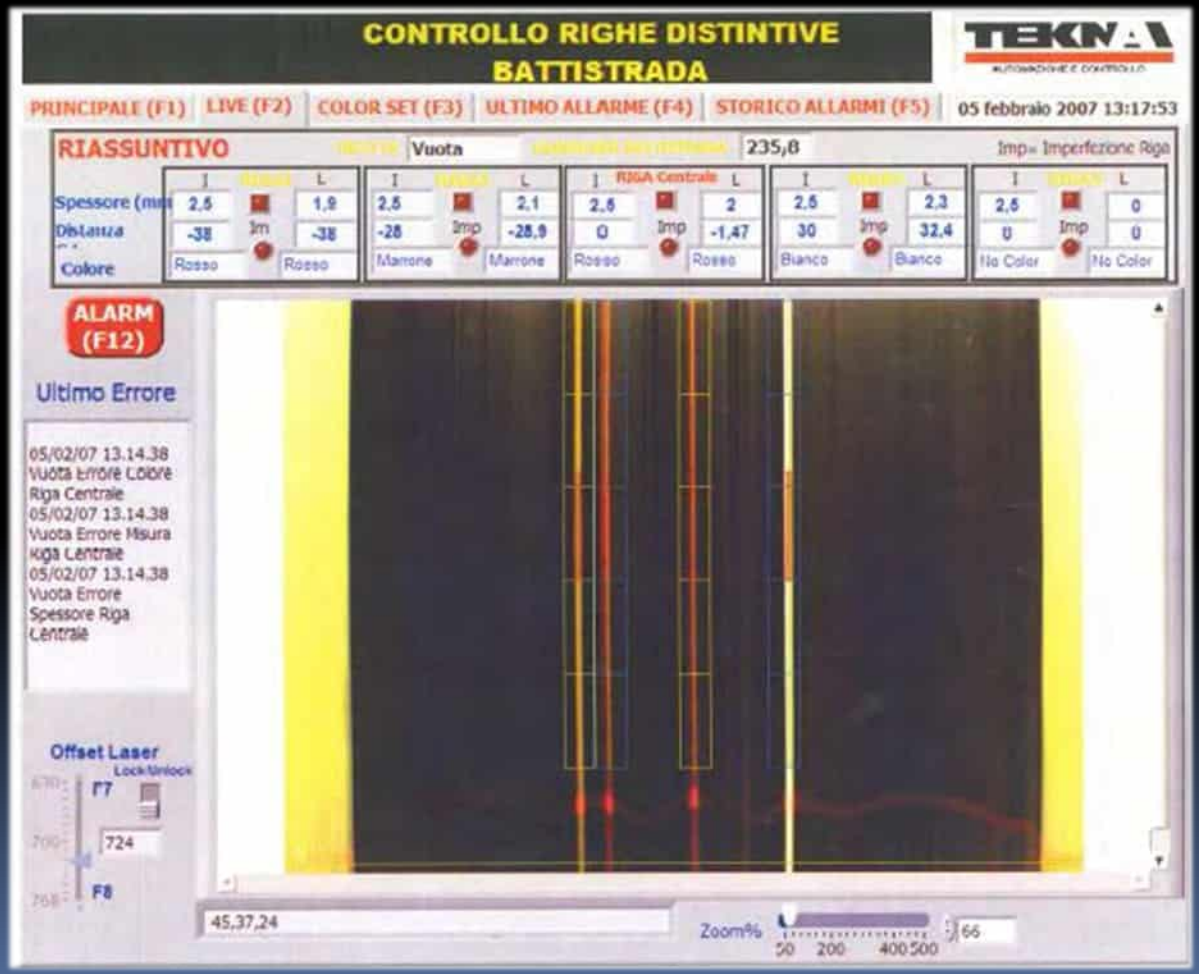
Tire BarCode and IPC Reader

BarCode Camera

IPC Camera

TIRE AUTOMATIC LINES

Tire Color Code Control



TIRE AUTOMATIC LINES

Band Defect Detector

The implemented system is based on laser profilometry to detect hole and hill on the surface of rubber with accuracy of 0,2 mm and an RGB system to detect scratches.

The system works in real time and the rubber is travelling at speed of 30 m/min.

TIRE AUTOMATIC LINES

Tire Defect Detector

The tire defect detection process is based on an innovative automatic system that combines lasers and high speed rate cameras for the scansion of the tire and its tridimensional model reconstruction, used to find and characterize the defects on the tire that is being analyzed.

This system, integrated with the automation for the tire handling at the end of the assembling process, allows to control the quality of the tire and detect whenever any defect (bubbles, scratches, scarcities, folds, cuts and so on) has occurred in the inside and the outside of the tire. This task is actually done by specialized and well trained workers. The installation of this automatic system will result in a remarkable saving on the TIRE PRODUCTION COSTS.

TIRE AUTOMATIC LINES

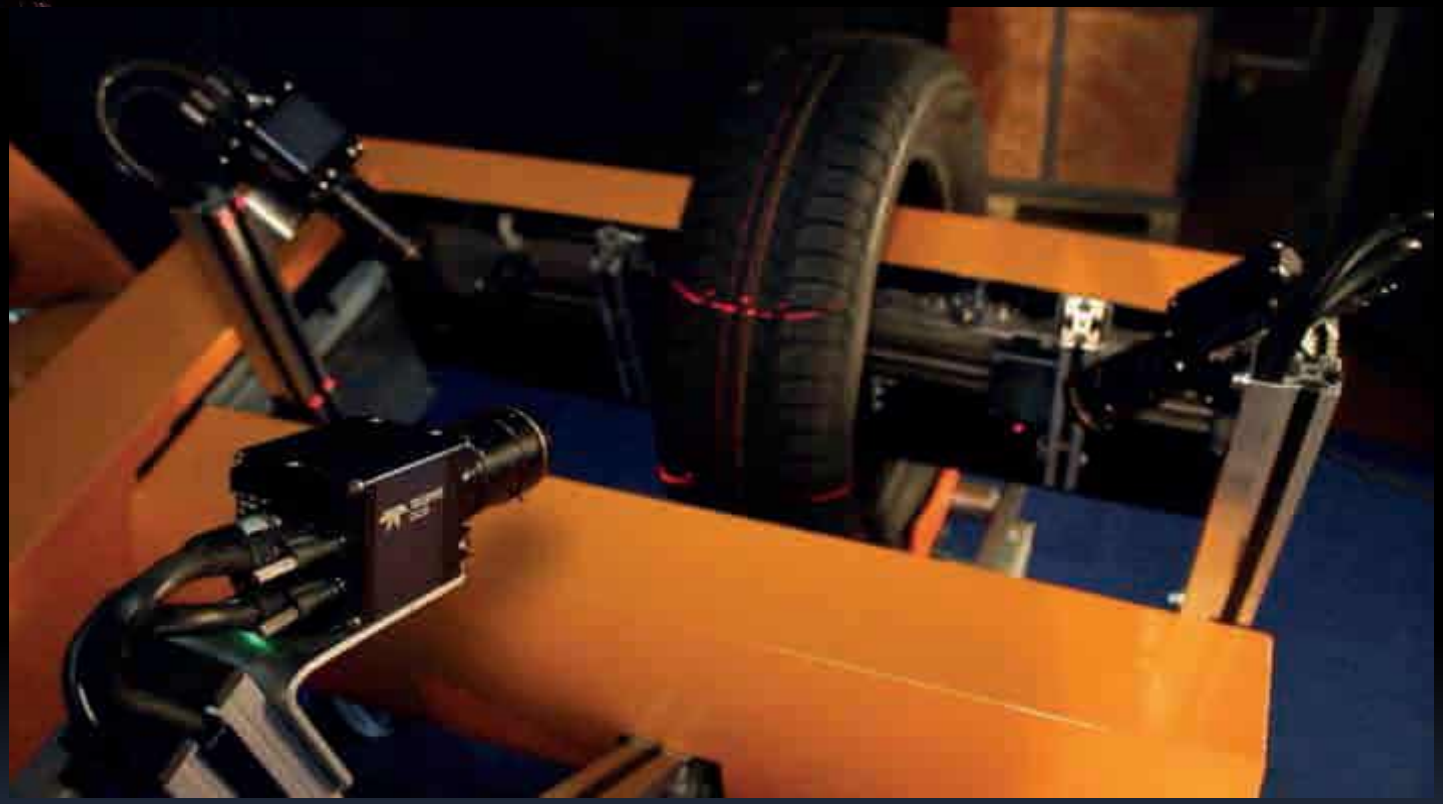
Tire Defect Detector – Technique

The technique used to have the tridimensional model of every single tire is the LASER PROFILOMETRY:

- A laser line is projected on the area of the tire that has to be analyzed
- The tire is rotated and a camera shoots the changing profiles that the laser assumes
- Specific algorithms create the tridimensional model, fusing the sequential shoots

TIRE AUTOMATIC LINES

Tire Defect Detector – The Machine

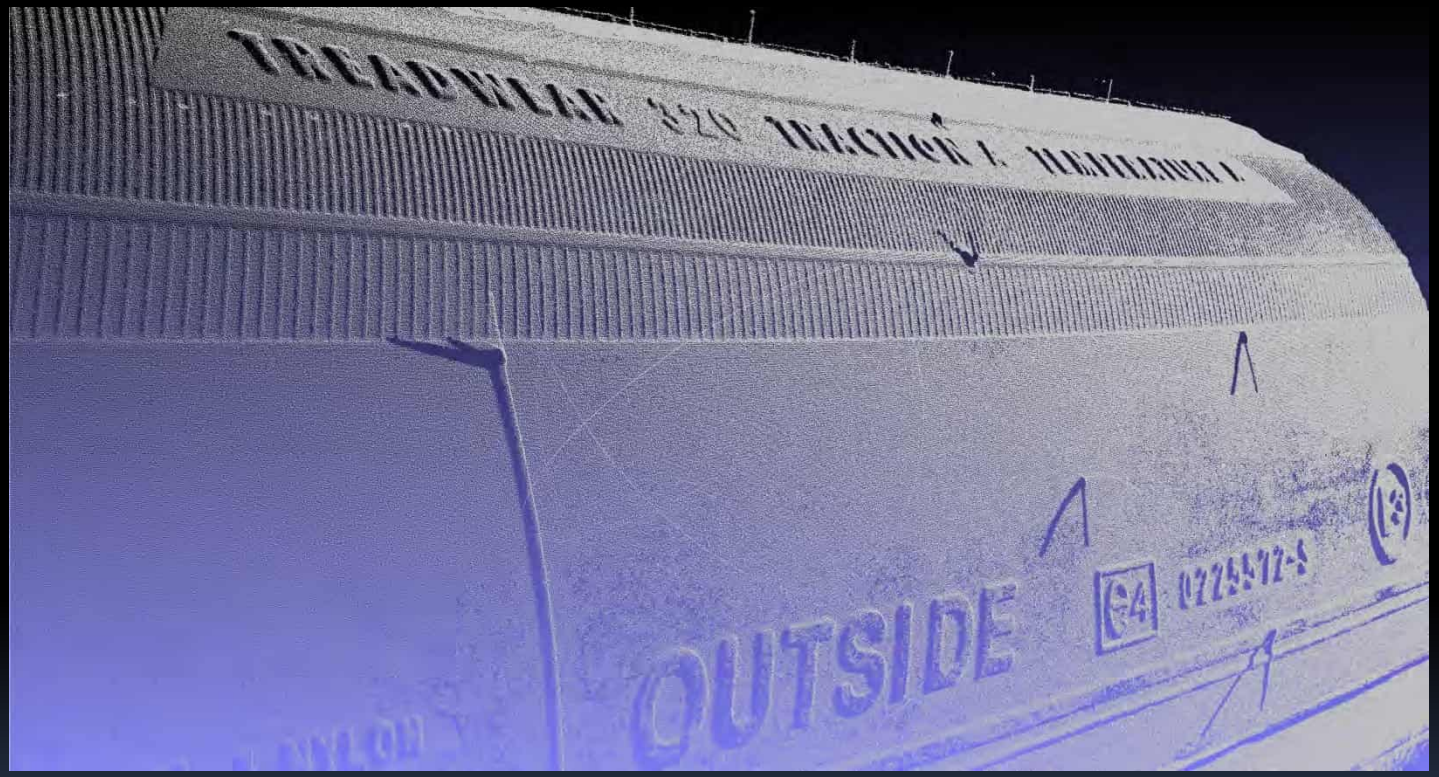


The acquisition task, operated by an automatic system, is composed of these steps:

- Take in charge of the tire that has to be inspected
- Positioning of the scanning system (lasers and cameras inside and outside the tire)
- Rotation of the tire and activation of the acquisition process in all the different areas
- Release of the tire and conclusion of the acquisition process

TIRE AUTOMATIC LINES

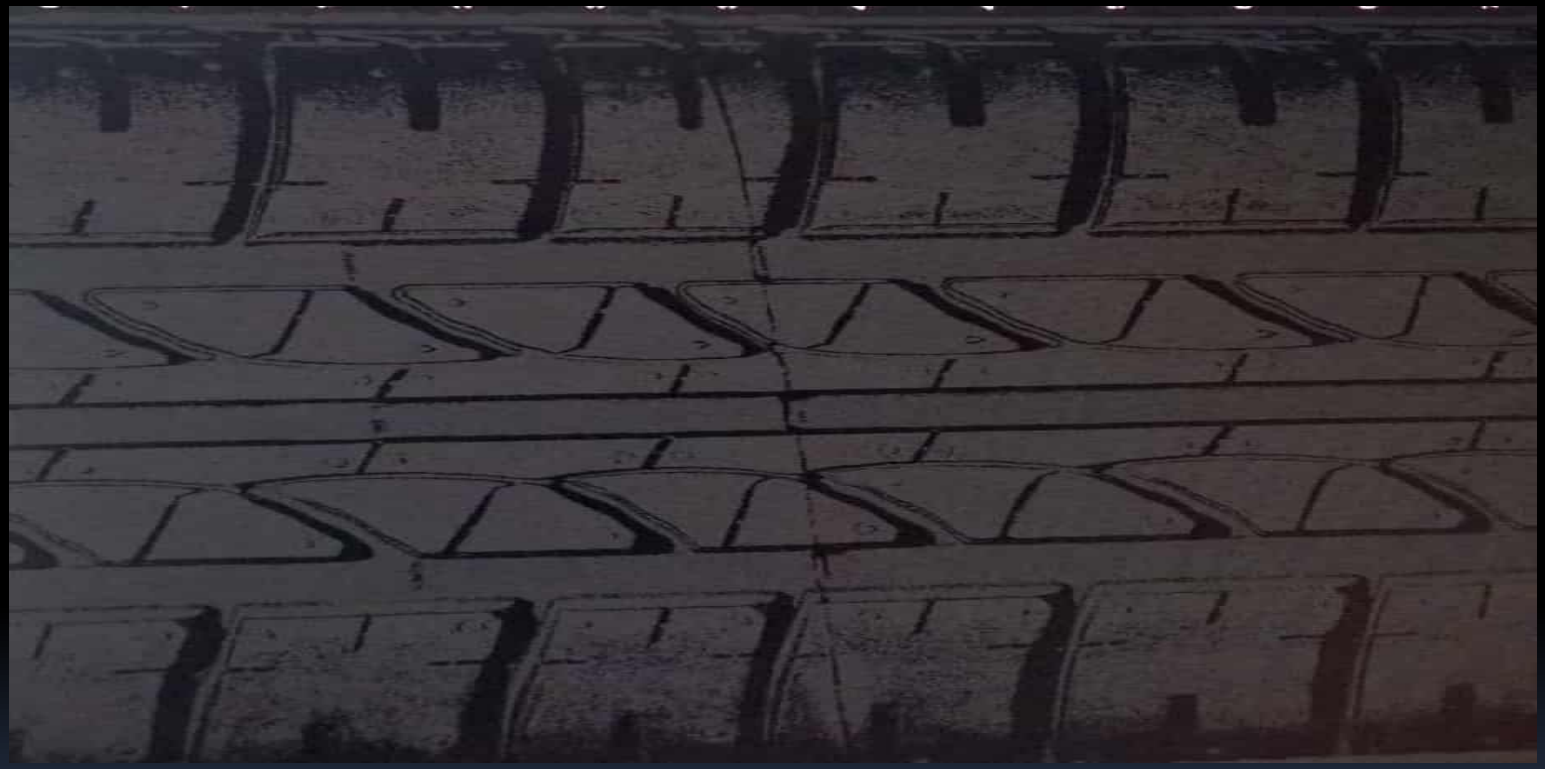
Tire Defect Detector – 3D Models



The model resulting from the acquisition task is composed of points that represent the tridimensional quotes of the tire in its every different area. The resolution used is of the tenth of a millimeter, but can be increased according to the different specifications.

TIRE AUTOMATIC LINES

Tire Defect Detector – 3D Models



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TIRE AUTOMATIC LINES

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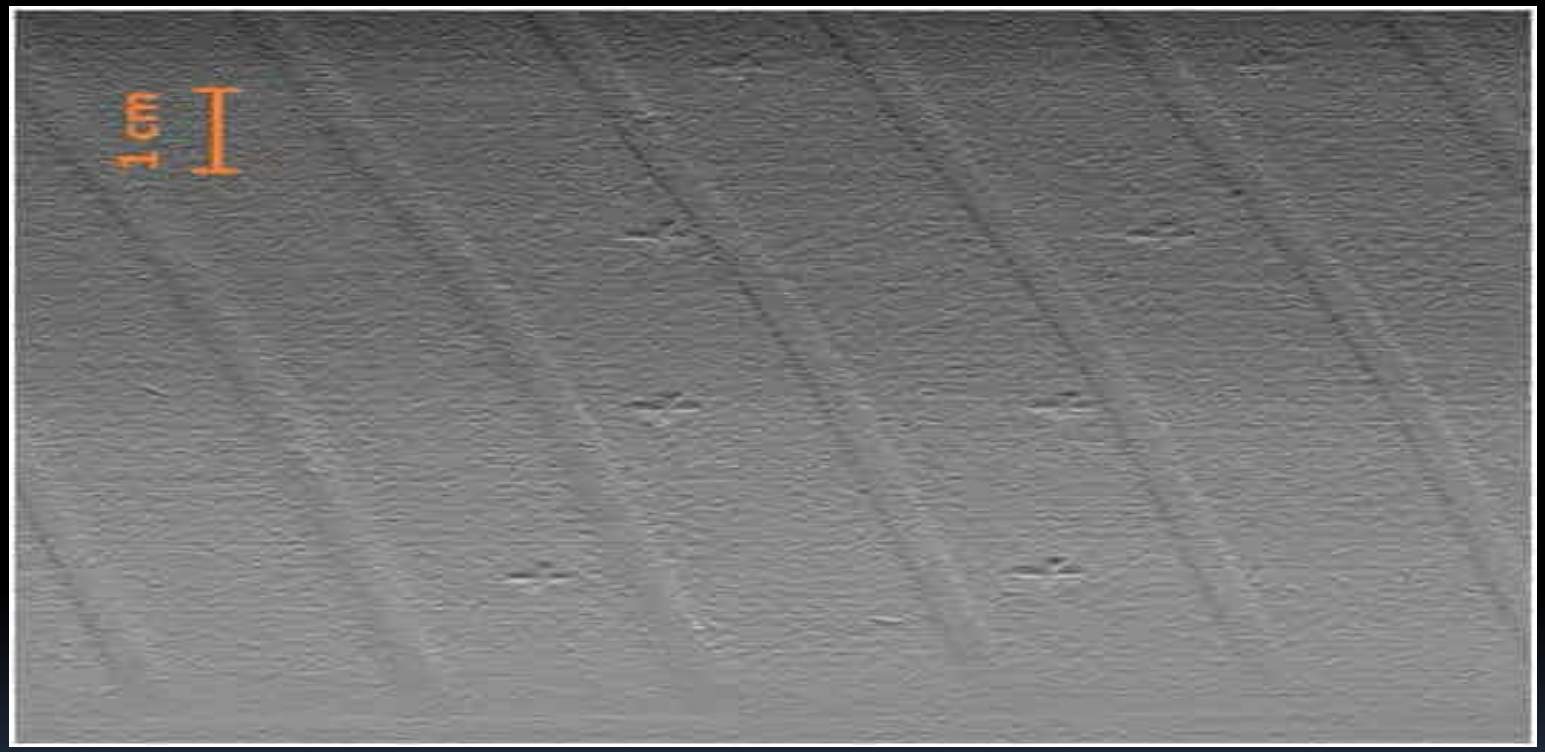

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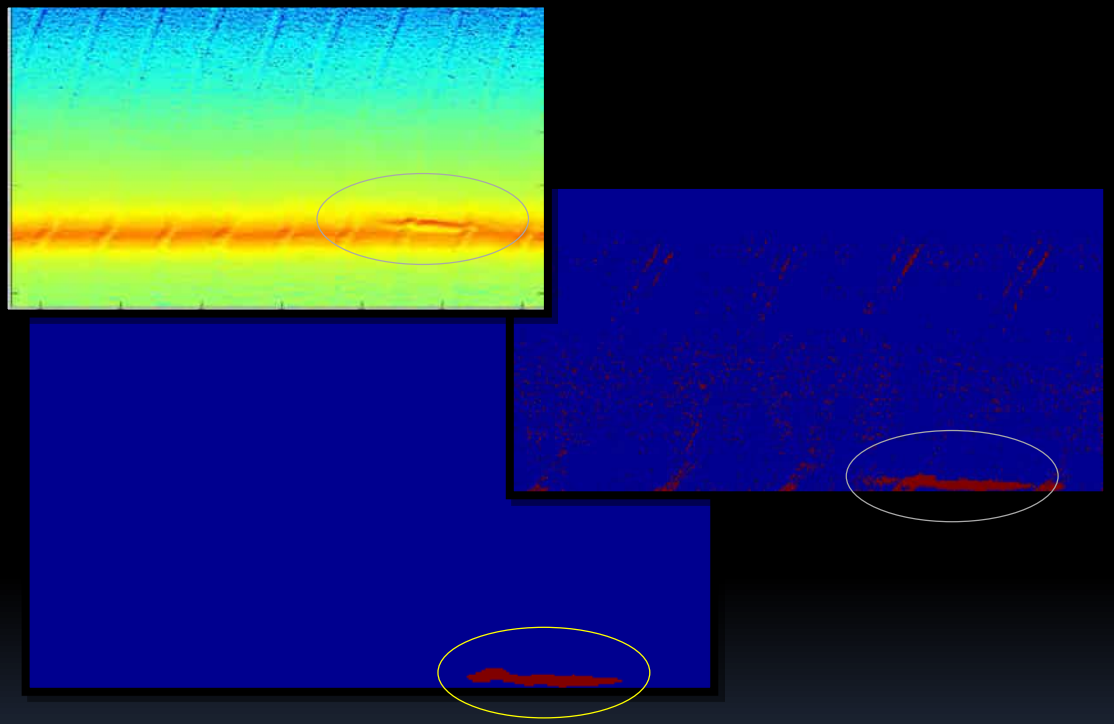
TIRE AUTOMATIC LINES

Tire Defect Detector – Results

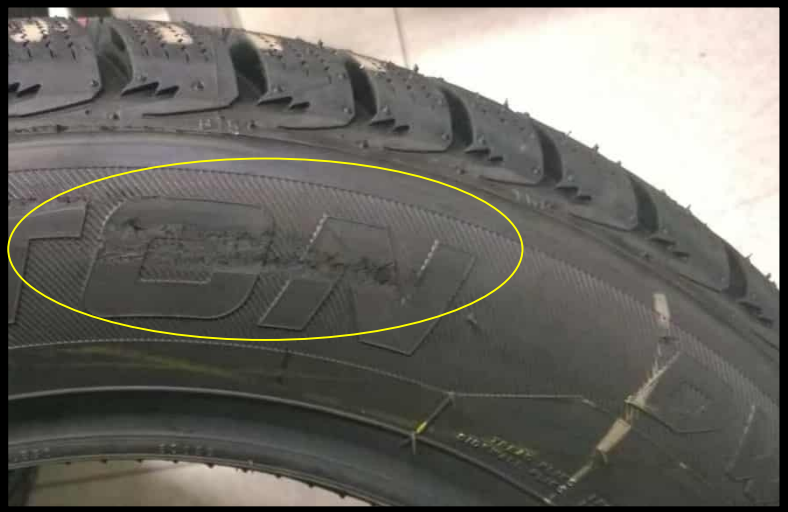


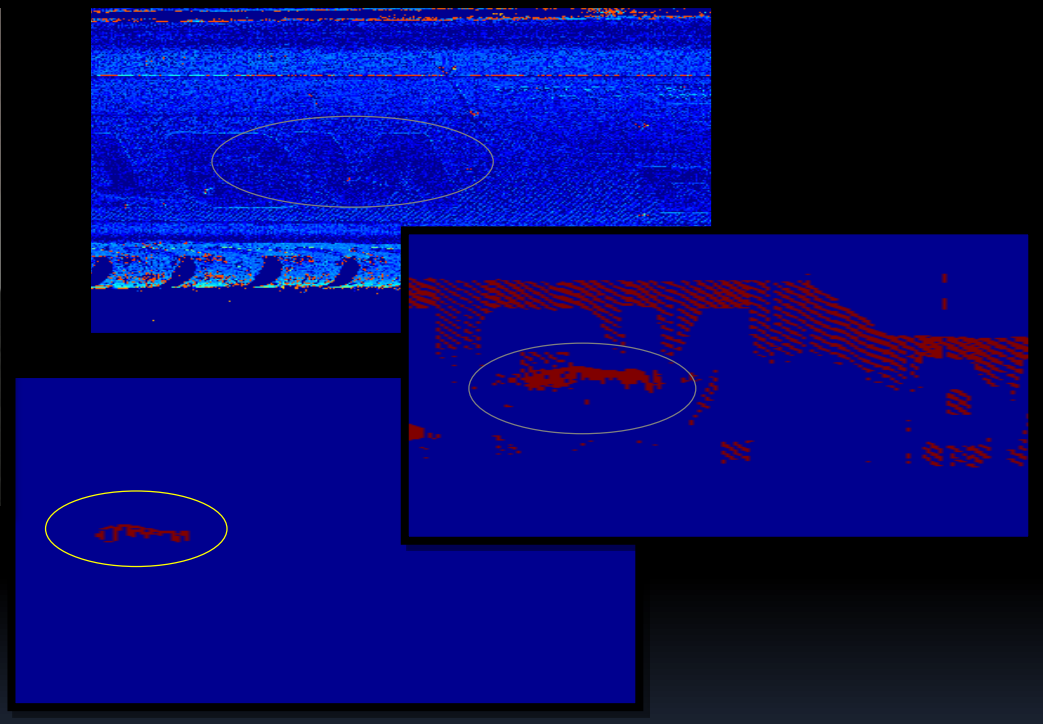
Using ad hoc elaborations for every single area of the tire, possible defects resulting on the tire are detected. The pictures above show some steps of the elaboration part used to detect the presence of different kinds of defects.

DETECTION OF AN AIR BUBBLE IN THE SIDEWALL SEEN FROM THE INSIDE

TIRE AUTOMATIC LINES

Tire Defect Detector – Results



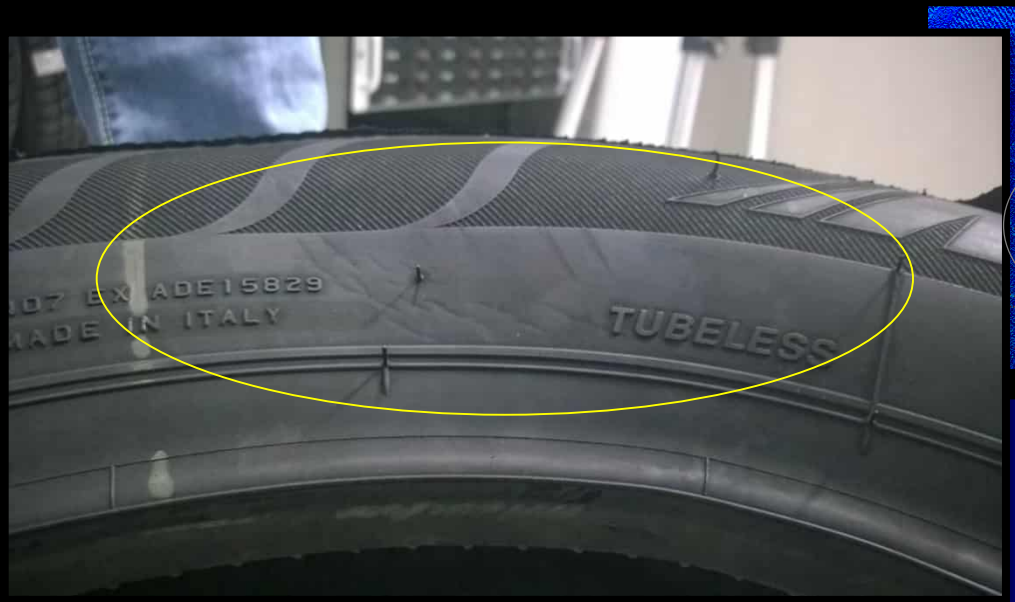


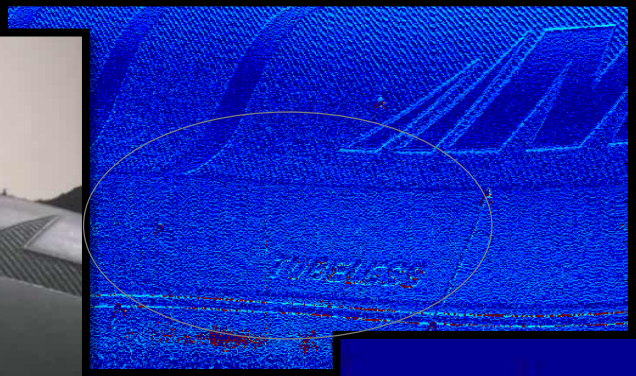
Using ad hoc elaborations for every single area of the tire, possible defects resulting on the tire are detected. The pictures above show some steps of the elaboration part used to detect the presence of different kinds of defects.

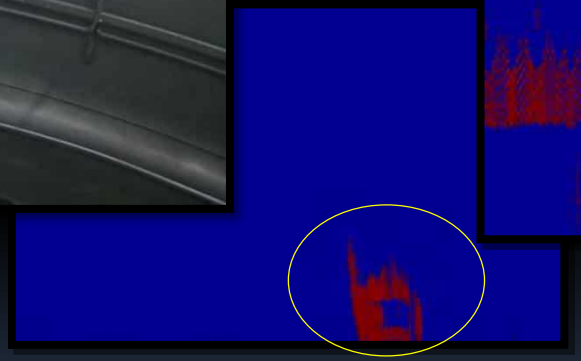
DETECTION OF A SCRATCH ON THE SIDEWALL SEEN FROM THE OUTSIDE

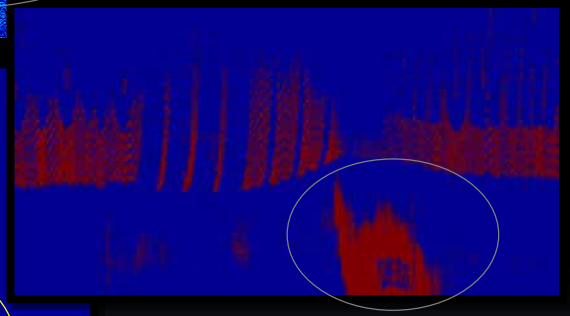
TIRE AUTOMATIC LINES

Tire Defect Detector – Results









Using ad hoc elaborations for every single area of the tire, possible defects resulting on the tire are detected. The pictures above show some steps of the elaboration part used to detect the presence of different kinds of defects.

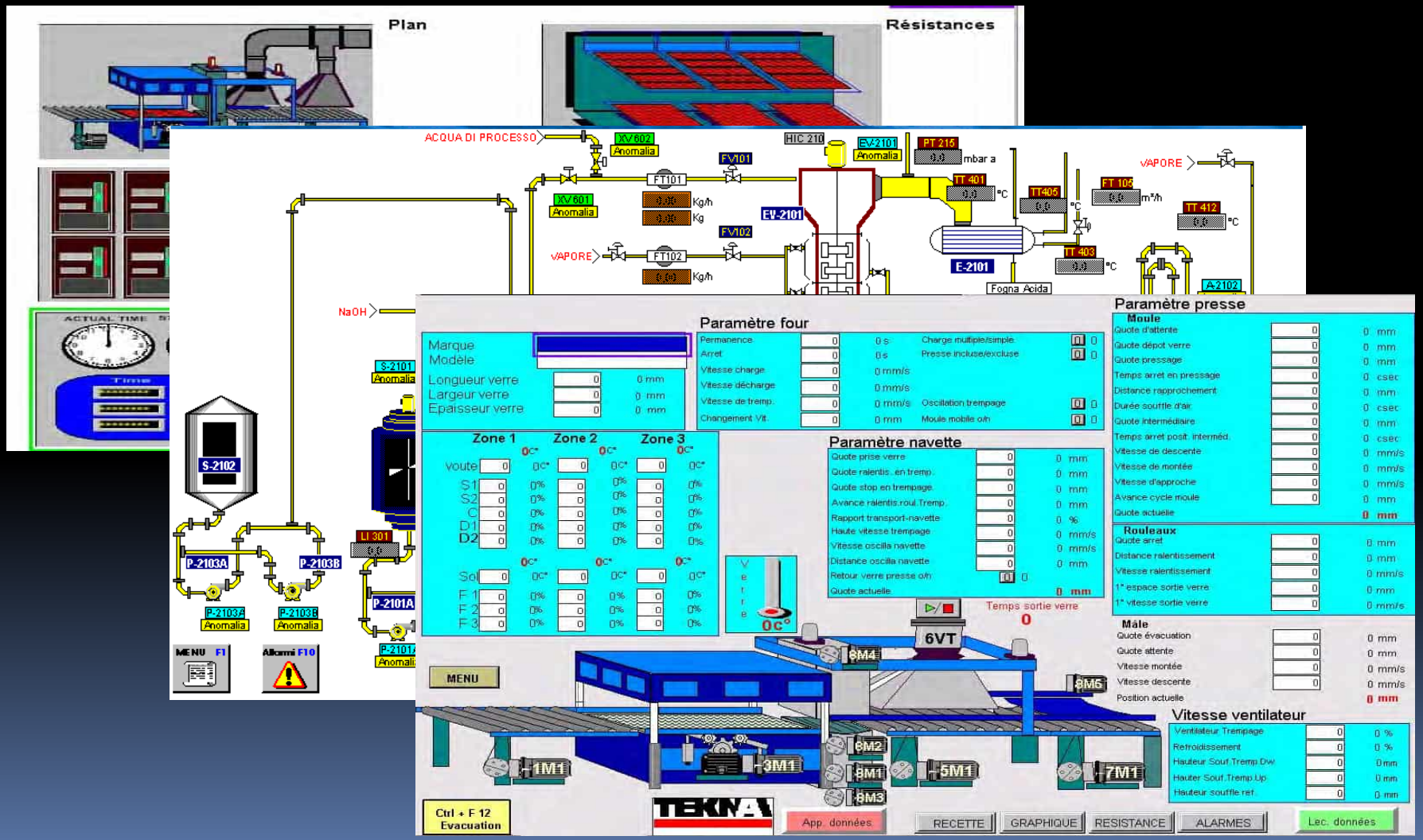
DETECTION OF A DEPRESSION ON THE SIDEWALL SEEN FROM THE OUTSIDE

SUPERVISION SYSTEMS

Operator Interfaces

SUPERVISION SYSTEMS

HMI Interfaces



Tekna Automazione e Controllo, thanks to the experience developed over the years, can take care of the design, realization, installation and integration of automation equipments on automotive production lines.

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