

LETTERING SYSTEM

SAFETY WARNING: THE FAILURE OF THE TIRE DUE TO UNDERINFLATION/OVERLOADING-- FOLLOW OWN
INSTRUCTION OF TIRE/PLI ASSEMBLY DUE TO IMPROPER MOUNTING--
STATE TO RECOMMENDED PRESSURE-- MOUNT ONLY ON 17 INCH DIAMETER
ONLY SPECIALLY TRAINED PERSONS SHOULD MOUNT TIRES.

VISION
SYSTEM 3D

TIRE



In tire production a critical phase is the lettering procedure.

During this inspection step it is checked whenever all the writings and symbols imprinted on the tire are correct and well placed. For those international normative that require the presence of defined symbols and writings on the surface of the tire and for the customer perceived quality of the tire itself, the lettering control is a crucial procedure in the tire production process.

VISION TIRE SYSTEM 3D - LETTERING

Vision Tire System 3D is an innovative three-dimensional vision system to reconstruct a 3D model of the tire in test and operates specialized algorithms for every different issue on the tire.

Vision Tire System 3D - Lettering can read and verify automatically every kind of writing and symbols on the outside of a not inflated tire with an high efficiency and high repetibility process, replacing the manual inspection that is an high focus and high risk procedure.



VISION TIRE SYSTEM 3D - LETTERING

uses the Laser Profilometry, a technique based on the triangulation between a laser line and an area scan camera, that let the system have a three-dimensional reconstruction of the tire surface with one of the highest reachable resolution in a very short cycle time.

VISION TIRE SYSTEM 3D - LETTERING

taking into account the plant sheet specification of the tire in test, consisting of a list of all the writings and symbols that have to be imprinted on the tire, verifies if all the elements on the list are correctly imprinted and placed on the tire surface. Additional controls can be operated, as the analysis of the deterioration of the mold, where the stamp height of the characters on the tire in test is compared to the expected one. A limit tolerance can be set to raise an alert when the mold is getting dirty, deteriorated or damaged.

TECHNICAL FEATURES

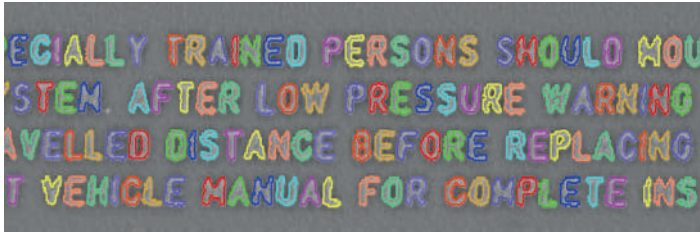
Types of Tire	Passenger / Two wheels
Tire Size	Rim Size: 13 to 22 inch Out Diameter: 900 mm
Inspected Area	Outside Surface
Sequence of tire	Any, due to automatic preset of positioning system and inspection parameters for every different tire typology
Detected kind of Issue	Wrong character/symbol imprinted, Misplaced/ Missing/Upside-down Stamp Mold Deterioration/ Dirtiness Alert
Minimum size of Letter	2 mm
Detection Repeatability	100%
Cycle time	Under 60 sec
Control Type	Manual or Automatic loading system, automatic scanning, PC elaboration and P.L.C. supervision
Plant Network Integration	Ethernet TCP/IP
Tuning Algorithms Parameters	Auto tuning based on a master tire and associated tire specification sheet
Analysis technology	Laser profilometry for 3D Model acquisition and optimized algorithms for lettering inspection and control



STAMP READING



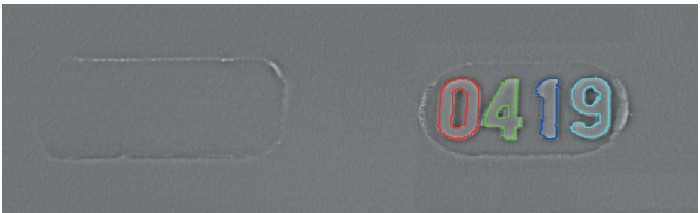
SYMBOLS CONTROL



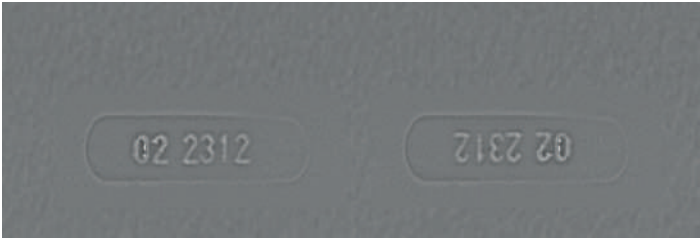
SMALL LETTERS READING



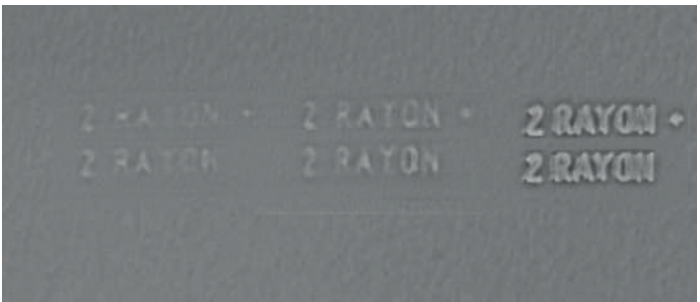
TIRE REGULATION READING



MISSING STAMP DETECTION



MISPLACEMENT DETECTION



DIRTY STAMP DETECTION

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