Machines That Learn From Defects

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EMPHASIS: *Fastener Failure*

Like any sizable or complex manufacturing project, the production of mechanical fasteners also involves such a large variety of processes that attaining zero defects is technically not possible. However, today we can LEARN FROM DEFECTS and improve quality control.

Dimensional characteristics and material structure can be 100% controlled with state-of-the-art inspection and sorting machine technology, but there are still defects of aspects that often require a final visual inspection, which only the human eye can guarantee by manual sorting.

AI (Artificial Intelligence) comes to our aid together with the incredible computer power available today with the latest generation of graphic controllers based on advanced microchips.

New AI Algorithms

In 2020, the Dimac Research and development implemented new AI algorithms to process the images taken from the surface digital cameras and to support the operator in the defect teach-in process. Defective parts are positioned below the surface cameras, the system acquires the images and the operator highlights the defect in the image on the touch screen by the available tools.

Defects like cracks, stains, deformations, hints, dents and lack of material, which could not affect the part dimensions are highlighted by the operator and taught-in the system. After the preliminary fast teach-in process, the system will be capable of recognizing similar defects in the batch and the machine will be able to sort the parts.

Indeed the AI algorithms require the availability of an exhaustive gallery of NOK samples in order to create a library of images of visual defects, which becomes the reference for the training of the system.

Additional Algorithm Advantages

The benefits of Dimac Srl's artificial intelligence algorithms are not limited to inspection. The algorithms also interact with the company ERP systems to exchange a large amount of data regarding the sorting cycle of every batch of fasteners including measured characteristics, attribute defects and tracking statistics about the defect distribution in the batch.
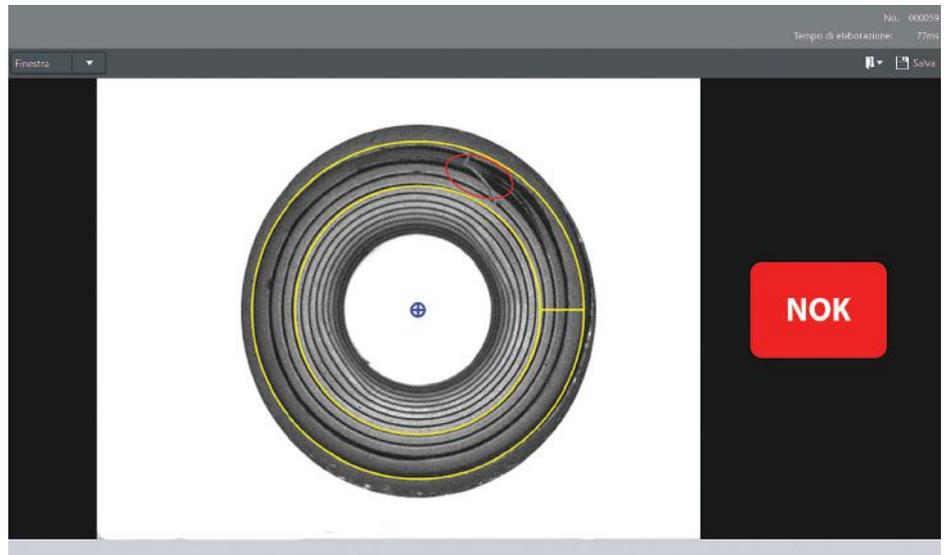
Latest Vision Inspection Software

Artificial intelligence features are included in the last generation MCVx vision inspection software from Dimac. The MCVx vision inspection software is optimized for the brand new MCV6 high-speed inspection and sorting machine, based on a glass rotary table.

The MCV6 inspection and sorting machine represents one step ahead for Dimac Srl along the path to zero defects. The MCV6 is an AI native machine, running with a fanless controller that is based on a processor of the 8th Intel® generation 2660 Mhz DDR4 with GigE ports for high resolution digital cameras and ultimate USB ports for external devices.

For further discussion, contact the author at Dimac Srl in Italy or to learn more about the equipment and technology available from Dimac Srl, visit the company's website. *www.dimacsrl.com* **FTI**