State-of-the-Art 100% Inspection & Sorting for Heat Treatment

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Heat treatment is very important for automotive safety fasteners. It's a delicate process, which could be monitored by the modern Industry 4.0 technologies, but still requires a final 100% analysis of each part before shipment in order to fulfil the automotive supply chain requirements.

Heat Treatment Control is surely a kind of NDT (Non-Destructive Testing) inspection on which **Dimac Srl** has invested important research and development energies during the past three years, reaching today outstanding performances in terms of sorting rate and inspection accuracy.

Partnering with the most important NDT device manufacturers for HT detection, Dimac has renewed all the machines of the range with state-of-the-art NDT Stations capable of performing this crucial control with the highest accuracy and productivity rate.

The eddy current station scans the part by mean of 24 different frequencies to detect any minimum variation of the material structure as well as to detect plating and surface coating problems in order to prevent any premature fastener failures.

This type of control is mandatory for safety-critical parts belonging to the power train or to the brake system, or any application where fasteners are subject to constant vibration or exposed to corrosion.

The man-machine interface of the Dimac application for HT detection is really user-friendly. The setup is intuitive, thanks to the multi-frequency testing process made simple by a wizard procedure, which easily recognizes and sorts out any fastener with deviations from the expected signal envelope.

A Clear Saving of Time & Costs

The brand new generation the Dimac MCV6 glass rotary table machine is the model getting more benefits—together with the best seller model MCV5—from the application of the HT NDT technology in terms of savings of time and costs. The innovative eddy current station allows the sorting of a wide range of complex parts by hardness classes with high output rates.

MCV glass rotary table inspection machine.

The HT station of the Dimac MCV5 and MCV6 uses two state-of-the-art eddy current coil-probes—a reference probe at the operator's workplace and a testing probe, which is positioned above the glass table. The system provides instant results while running, and this allows processing at a rate of up to 300 ppm.

HT NDT station (top) with close-up of control (botton).

The setup procedure is based on a teach-in process and requires boundary OK and NOK samples available at the operator's place. The setup sequence could be summarized as follows:

- The operator puts one OK sample into the reference coil-probe.
- The eddy current device detects the magnetic permeability of that OK sample.
- The operator enables the wizard procedure to record the reference data from the reference-coil probe.
- The batch of parts to be sorted can be put in the feeding system.
- The operator runs the sorting of a first quantity of 20 to 30 pieces to teach-in the response of the testing-coil, then the machine is stopped.

- The eddy current device compares the OK part reference data with the signal generated by the passage of the 30 pieces below the testing coil.
- The wizard procedure and its algorithm calculate the envelope of the taught-in signals and automatically sets the sorting threshold values.
- Nothing else to do for the operator, he just has to press the START CYCLE button and run the sorting machine.
- However, the system allows the operator to adjust the threshold and improve the accuracy of the setup in case of need.

The new concept cuts the time and costs of the 100% sorting process by making the operator's tasks far more efficient as well as by expediting the quality management job.

Conclusions

The new MCV6 is the summary of the Dimac state-of-the-art technology for optical and NDT inspection. Its nonstop feeding system is absolutely flexible to process a huge range of parts, and it is able to further increase the sorting rates compared with the MCV5, by up to 800 ppm for optical inspection and up to 300 ppm for heat treatment control.

The parts which are not controlled are automatically recycled into the feeding system of the machine, without loosing productivity.

Beside the NOK box, which is integrated into the machine frame, the machine houses a programmable evacuation channel with a box for special NOK parts, which have to be kept separated from the general NOK.

The MCV6 features very powerful functions for contour profiles check, 360° inspection, inner-threads quality inspection and surface defects recognition with AI. The Dimac inspection machines could be provided as "turnkey" solutions with ancillary equipment like bulk feeders and automatic box changing units for OK parts.

Dimac is distributed by **Angor-Intools** in North America and Canada. *www.dimacsrl.com* FTI

Company Profile:

Since more than 30 years, ***Dimac Srl*** *has been a reference point for 100% automatic inspection and sorting equipments for fasteners and special parts. Based in Tortona (AL), Italy, Dimac owns the complete know how to design, develop and manufacture his machines, providing turnkey solutions for optical inspection, gauging and measurement, NDT controls. Dimac exports worldwide for the most important producers of fasteners, guaranteeing them constant live support. Dimac is distributed in North America and Canada by* ***Angor-Intools, www.angor-intools.com****.*

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