

Vision Quality Inspection Success

Background

A metal fabrication company came to us with a problem. Their company specialized in the production of specific industrial metals. These metals were often shipped in large continuous rolls of thin sheeting.

Due to the manufacturing process there would occasionally be small 0.88mm / 0.035" defect holes that would be created at random locations in the metal sheeting. This company needed to be able to precisely locate these holes without interrupting their production line, then be able to report hole locations to their customers to avoid any issues that may arise with their customers' production lines.

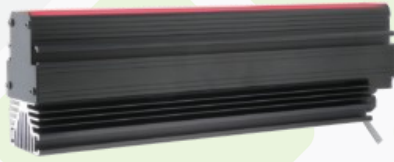
There were several difficulties surrounding their issue. The primary difficulty was locating the holes due to their size. Since many of the holes were down to the millimeter size, it could be easy for a worker to visually miss one of the holes. Another difficulty was the speed at which the production lines needed to remain operational.

One production line was running at a speed of up to 250ft/min and two were operating at speeds of up to 90ft/min. A final difficulty was that on several of the production lines sheets of metal needed to be inspected immediately after exiting a heat treatment oven. This created additional challenges within the inspection area.



Solution

Engineers at Diamond Technologies recognized the opportunity to utilize their extensive knowledge of vision systems and vision inspection in order to solve this customer dilemma. To solve this issue, Diamond engineers constructed a custom vision inspection station for use immediately after the heat treatment process on the customer's production line.



Advanced Illumination Bar Light

P17 Series 1090x1200, 48FPS,
Grayscale, Smart Camera



In order to spot holes through the metal as the sheet exited the heat treatment oven Diamond used 3 P17 1.3MP Smart Cameras in combination with a 50" industrial LED backlight and 750 series industrial I/O controllers from three of our partners Advanced Illumination, Datalogic, and WAGO. Diamond also utilized an MX Vision Processor and M-Series cameras where faster speed was needed.

Diamond utilized the red light from the back light to shine up through any small holes in the sheet to create a "star-like" pattern and allow the smart cameras to detect the holes on the other side. This allowed the detection and measurements to take place at a distance from the fast moving metal, while also maintaining a highly accurate and automatic reading and detection process of each small hole that may be present within the sheet.

Diamond Technologies additionally developed a software application that interpreted the light detections and referenced them to the speed of the moving metal sheet in order to create an individualized report of all holes and their specific location. This report was then sent to a customized work station created by Diamond Technologies where plant workers could review and print the full hole location report. The customer was then able to ship each roll of metal sheeting along with this report to their end users.

The success of this project was made possible by Diamond Technologies' expertise in the field as well as its continued belief that our customer's success is our success.



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