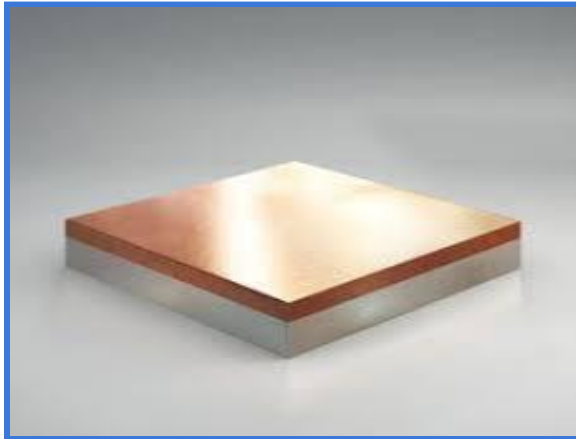


USE CASE

SURFACE INSPECTION OF BI-METALLIC STRIPS USING AI-BASED MACHINE VISION SYSTEM



CLIENT/INDUSTRY BACKGROUND

The client is a manufacturer of metal sheets. One of its key products is the bimetallic strips. These strips are used to convert temperature fluctuations into mechanical displacement.

Bimetallic strips are used in several household appliances like Ovens, Irons, Refrigerators, heat convectors, etc.

PROBLEMS

- During the production process, abrasive particles enter between two sheets that cause irregularities in shape.
- Poor handling of the strips is the reason for scratches.
- Pre-production processes like molding steel, bronze, or other metal bubbles occurred that results in porosity in the product.

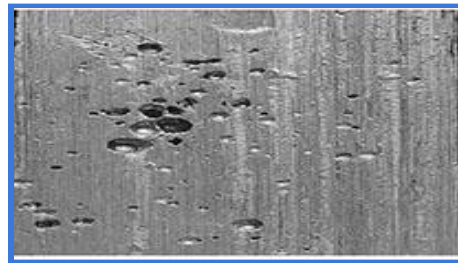
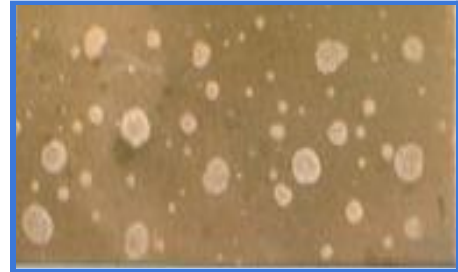
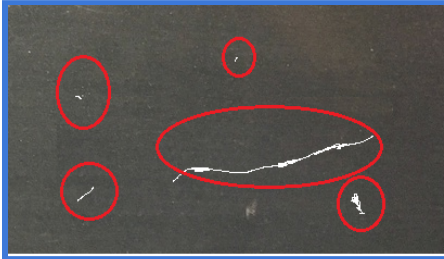
PROBLEM IMPLICATIONS

These strips are used in several home appliances to trigger particular actions based on temperature fluctuation. Anomalies cause the strip not to trigger such action at a certain temperature and eventually damage the appliance in which it is used.

CLIENT REQUIREMENTS

To automate the process of identifying surface defects on bimetallic strips, with the help of machine vision.

DEFECTS



CURRENT PROCESS

Inspection is being done manually, 4 personnel are deployed to inspect the bimetallic strip.

- Due to manual inspection, only 20 out of 30 parts could be properly examined. However, the production speed is at 30 parts/minute, which is leading to a 33% missing rate.
- The size of the defects will be as small as 0.15mm (Scratch, dent, delamination, coarse grains, etc) which could easily be missed out during the manual inspection.
- Manpower challenges :

Skilled and experienced laborers are required to quality check as per the criteria can lead to labor fatigue, considering the level of detailing that is required.

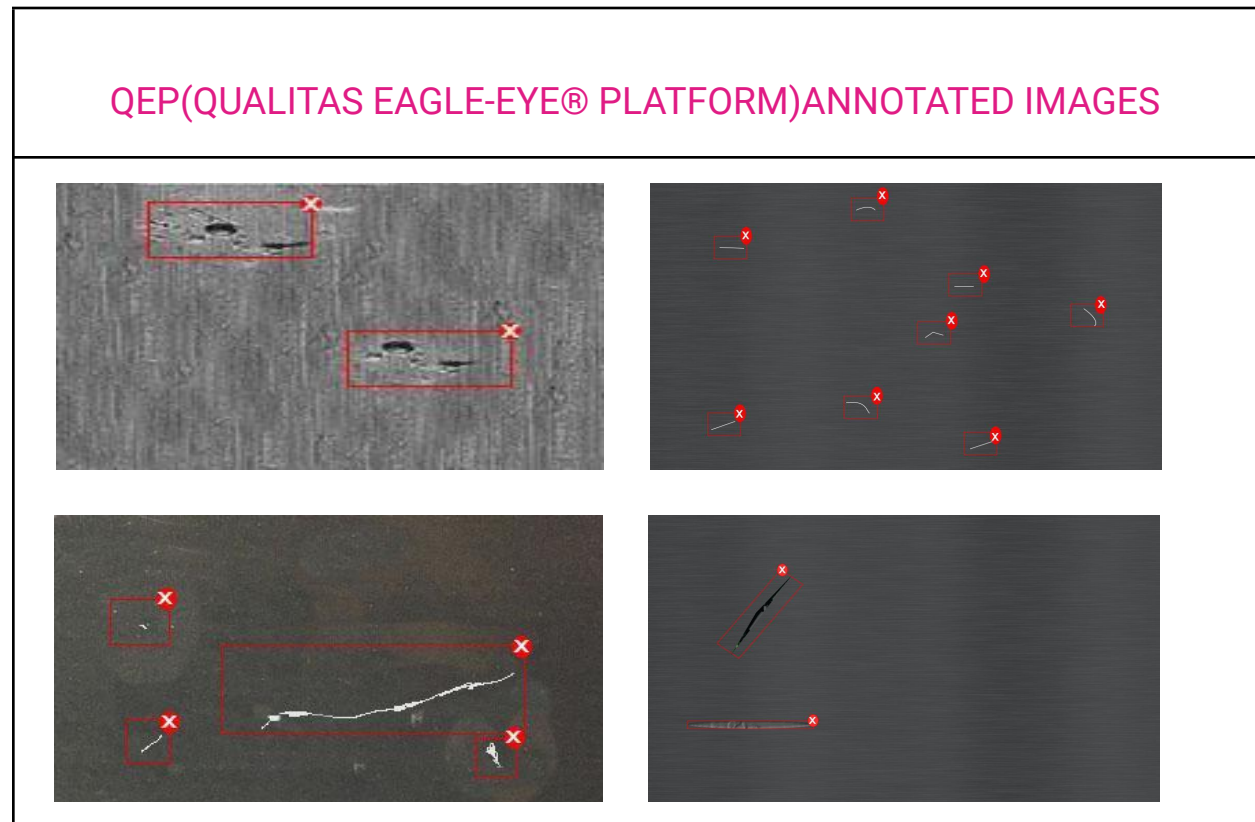
BUSINESS IMPACT

1. Decrease in customer's equipment efficiency
2. Increase in the number of customers and end-user complaints
3. Increase in cost of quality (COQ)
4. Increase in cost for labor training

SOLUTION USING MACHINE VISION AND AI

A camera or set of cameras with appropriate illumination (red lights in this case) is set up to identify the defects on the workpiece. Images are captured and sent to the software (Qualitas EagleEye® Platform) cloud where the training is done using the DL algorithm. Once the program is trained, real-time defect detection takes place, based on which the results are sent to PLC to take action.

IMAGES



CONCLUSION

With the conducted POC(Proof Of Concept) it is calculated that it can increase the customer's equipment efficiency that eventually results in minimizing the end-user complaints. It is demonstrating an accuracy level of up to 98%.



<http://www.qualitastech.com>

Qualitas Technologies Pvt Ltd
53 Kempegowda Double Road, BEML Layout 5th S
Raja Rajeshwari Nagar Bangalore 560098
INDIA
Email: info@qualitastech.com