



AI-Powered Quality Inspection for Aluminium Manufacturing

Aluminium & Building Material Manufacturing

Computer Vision | Quality Automation | Industrial AI

Business Challenge

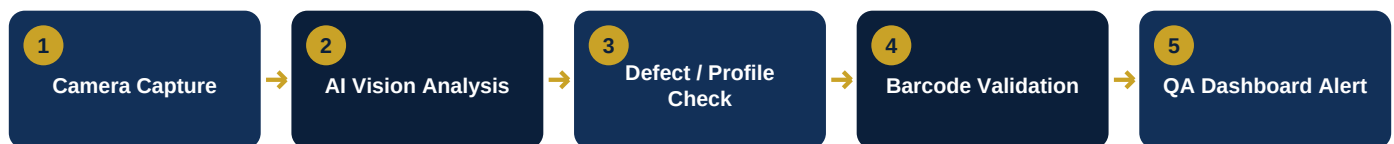
A large industrial manufacturer processes aluminium profiles through multiple stages including machining, coating and final assembly. Manual quality checks made it difficult to consistently identify dents, scratches, incorrect profiles, dimensional deviations and missing assembly components before products moved to the next production stage.

Solution

A multi-stage AI-powered visual quality inspection system was designed using industrial cameras, sensors and computer vision.

- Automated detection of dents and scratches before coating
- AI-based profile identification
- Barcode-to-physical-profile validation
- Dimensional and hole-position verification
- Detection of missing clips, rollers, caps and other assembly components
- Barcode-linked inspection history
- Central QA and plant-management dashboard
- AI-based restricted-zone human detection with automatic safety alerts

Solution Flow



Business Value

The solution enables defects to be identified earlier in the manufacturing cycle, reducing avoidable processing of defective material while providing a digital, image-backed quality trail for every inspected component.

TECHNOLOGY

Computer Vision, Deep Learning, Industrial Cameras, Edge AI, Sensors, Barcode Integration, Web Dashboard