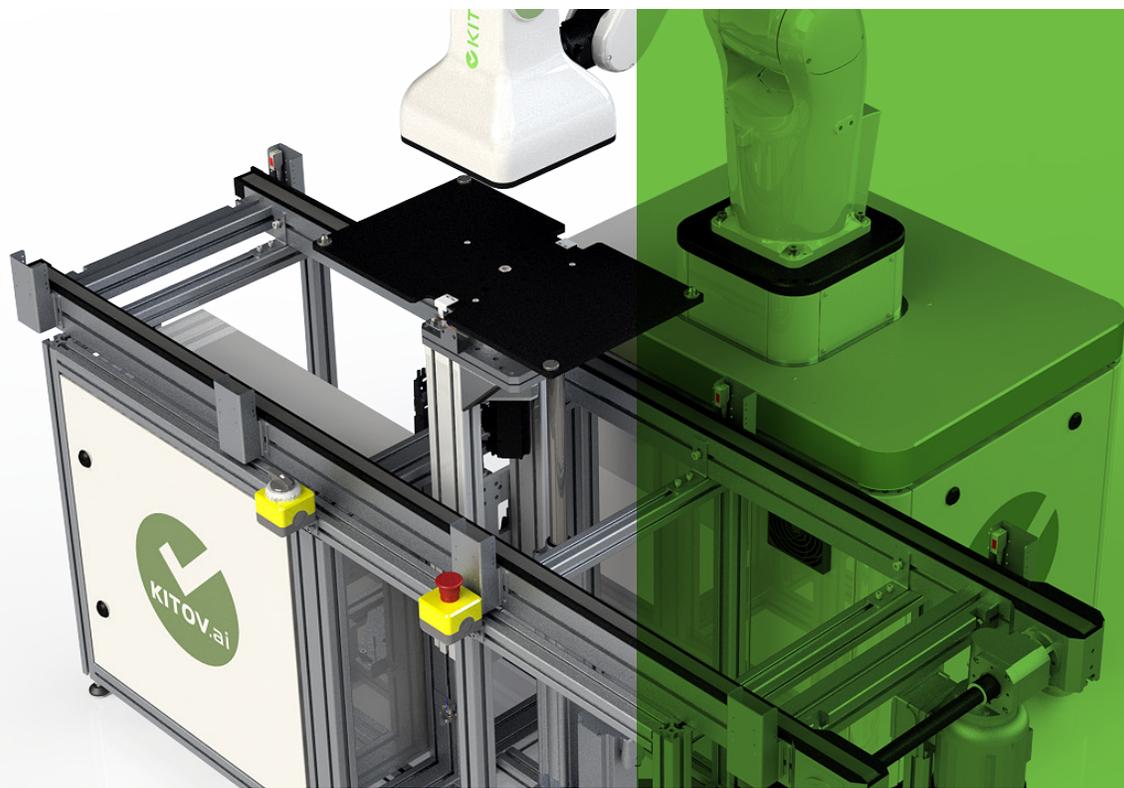# GLOBAL LEADER IN PLASTIC PARTS SOLVES INJECTION MOLDING, ASSEMBLY CHALLEGES WITH KITOV HYBRID DEEP LEARNING VISION SOLUTION

KITOV.ai

SOMETIMES, IT IS WHAT YOU

can't see that will ruin a perfectly good business relationship.

That was the situation one of the world's leading producers of injection molded plastic parts faced while building a multipart plastic toolbox for a high-end U.S.-based power tools supplier.

The company was producing high-end, injection-molded toolboxes at a rate of one per minute. Human inspectors would pick up each toolbox and rotate it a full 360 degrees to check 30 separate locations around the toolbox, including:

- Plastic tabs that failed to insert in guide holes
- Plastic deformations, short shots, and flashing
- Missing or damaged metal parts, clips, and other fasteners
- Poorly printed and applied labels
- Missing rubber parts or overflow
- Aesthetic scratches on the surface of all sides

Despite allocating two fulltime employees to inspect every box, the customer's high-quality demands meant that a single defective part resulted in the complete rejection of the entire shipment. Productivity and profitability suffered as a result.

In response, they turned to Kitov.ai for an automated machine vision solution.

From CAD File to Simplified Vision Programming

Replacing human labor with machine vision to inspect all sides of a part measuring upward of 50 cm on a side requires some form of material handling or robotic manipulation. Typically, developing a combined machine vision and robotic guidance solution is the work of one engineer who spends several weeks using CAD files to devise a robot program to accommodate dozens of regions of interest (RoIs) and the vision programming steps. Furthermore, every subsequent change to the inspection plan requires intensive work from a robotic expert and a machine vision specialist.

Further complicating the solution is the need to solve some RoIs, such as label print quality, using 2D vision while others, such as missing parts and label application, require some level of 3D machine vision solution. Solving the robotic and machine vision inspection steps would normally take months in a lab before being brought to the floor for commission and installation.

The Kitov One hybrid 2D/3D/deep learning inspection system generates golden parts from 3D scans, simplifying programming while also finding difficult-to-detect defects, such as surface damage to reflective parts.

Production engineers from the plastics company, working with Kitov.ai staff, were able to program an automatic solution for picking the toolbox from a conveyor, placing it on an inspection station, inspecting the box, and then closing the lid for more inspections before returning it to the conveyor — all within one week. By the second week, the work cell installed next to the production line was operating at 99%-plus accuracy on all inspection points. When additional inspection points were needed, changes to the inspeciton plan were implemented within hours.

"In addition to helping our customer protect a critical contract and customer brand, the results from the machine vision system showed the engineers that manual inspectors did not have the same definition for every defect," explained Adam Tabor, Chief Operator Office (COO) of Kitov.ai. "At the same time, qualitative inspection data helped engineers to identify upstream manufacturing equipment and assembly steps that were leading to defective product, allowing them to correct those issues before they caused waste product quality issues. Within weeks, the system had fully paid for itself."

Kitov.ai has since added deep learning algorithms to its 2D and 3D machine vision inspection platform, again utilizing CAD files from 3D product scans to expedite and simplify the programming process. For more information on Kitov.ai's approach to hybrid machine vision solutions, visit Kitov.ai ✅

The ability to combine 2D, 3D, and deep learning machine vision inspection algorithms allows this inspection system to find hidden defects, from fastners damanged during installation to warped parts created by defective-injection molded parts or assembly of these parts.
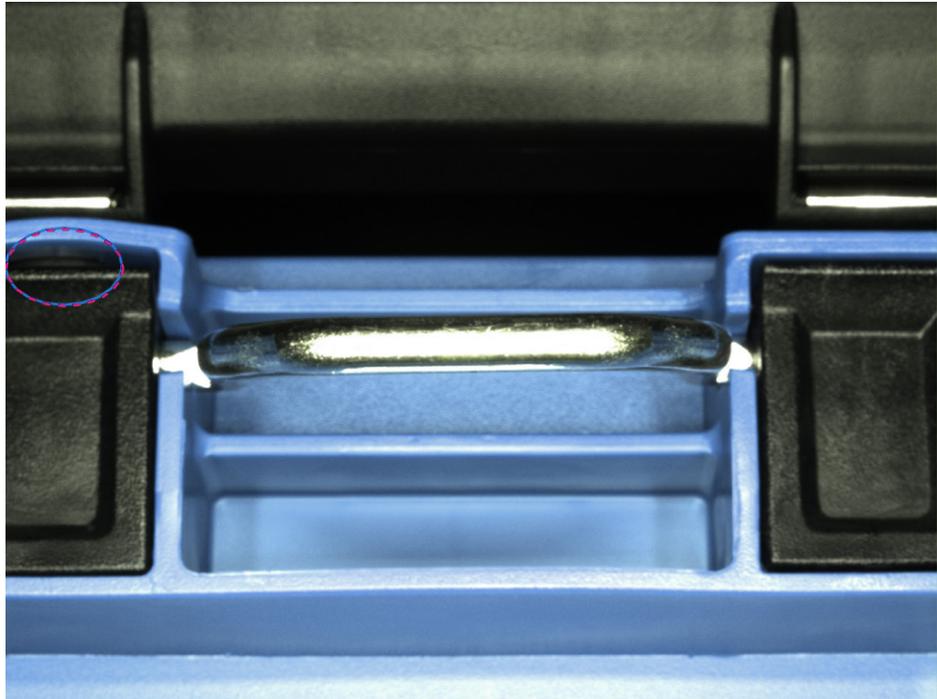
Kitov.ai solutions are implemented in disparate applications in various market segments. Please contact Kitov.ai via the company website **(www.kitov.ai/contact)** or **Corey Merchant at: corey.merchant@kitov.ai.**

✅ KITOV.ai