

Bluewrist Case Study

100% Inline Electric Vehicle Battery Tray Inspection

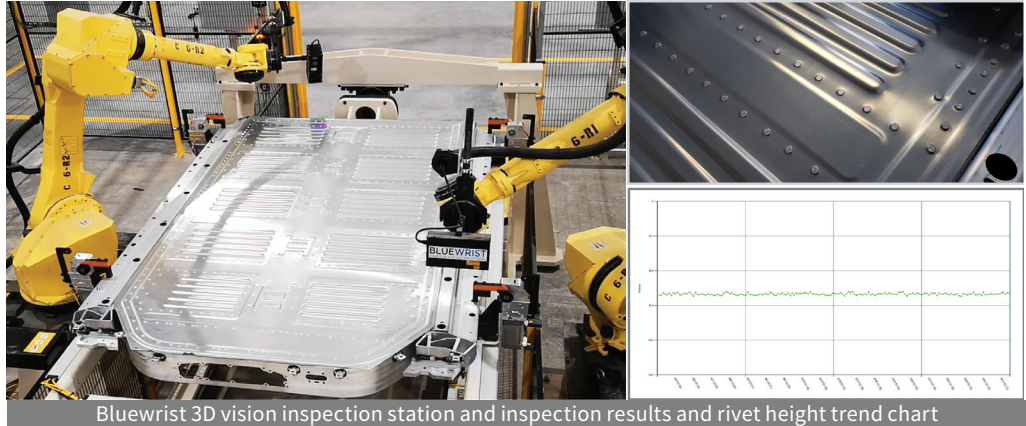
Our Client

Our client is planning to produce electric vehicle (EV) battery trays for an upcoming high-performance electric vehicle. These highly-engineered components play a critical role in vehicle safety, rigidity, and weight. As a result, they require over **500 rivets** and more than **100 welds**. With an anticipated production volume of 65,000+ annually, the inspection cycle for each tray must be completed **in less than 200 seconds**.

The Challenge

The battery tray weighs approximately 80 kg and is 4 meters long and 1.5 meters wide. Further complicating matters, the tray contains several hundred features – including important welds that need to be completed without any defects before adhesive sealants are applied. This process is essential to produce an airtight, leak-proof joint and seals that can accommodate the battery pack's thermal expansion and enable it to withstand vibrations and stress when the vehicle is on the road. Following this, brackets and rails must be fitted and various holes and slots correctly positioned.

Since this multistage manufacturing process involves over 20 steps, quality control must be comprehensive to



ensure that any defects are identified at an early stage and reworked. If problems are identified too late in the process, the part must be scrapped.

To guarantee structural integrity, over 100 welds must be inspected. Afterwards, more than 500 clinched sheet metal rivets need to be checked at 0.1mm accuracy, because the height of the raised round rivets determines how much pressure must be applied when the sheets are joined. Finally, various holes, slots, and mounts need to be inspected to comply with GD&T specifications – ensuring the correct fittings and alignments of hundreds of battery cells prior to final assembly.

The Solution

We were approached to come up with a solution for an integrated 100% inline 3D vision inspection system that can continually monitor production quality. Working with the manufacturer, we designed a system that uses two FANUC robots and two laser profile cameras. As the robots carry out high-speed inspection on all the critical

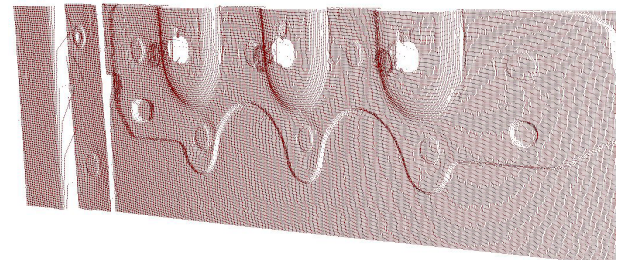
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features, the results are recorded and the 3D point cloud is processed and verified against GD&T and weld specification sheet to identify any defects. Given the complexity of the battery tray, we tested the system extensively with feasibility studies before deploying it on the production line.

The Results

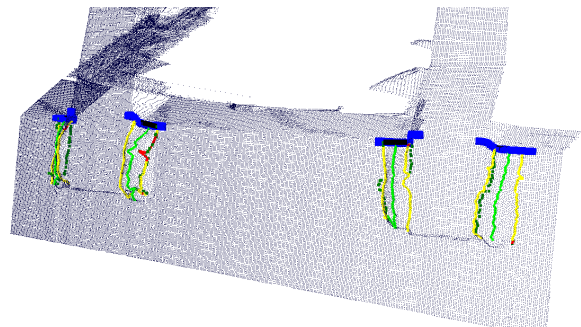
Our expertise enabled us to deliver a high-performance inspection system that provides a complete solution – analyzing each of the battery tray’s critical features. This ensures that every component is defect-free when it reaches the end user and that it will last the vehicle’s life-time. All of this is achieved in under 200 seconds.



Various features on the battery tray and 3D point cloud



Weld features on the battery tray



Weld feature inspection results and analysis

Contact Bluewrist Today!

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