



Thermoformed Fridge Liner Inspection

Our customer wanted to inspect thermoformed fridge liners to ensure that they met their quality criteria and to monitor any drift in the production process. The starting sheet of ABS (~5 ft by 3 ft) is marked with a grid of colored lines and then formed into the liners. The objective is to capture an accurate 3D image of the complete liner with the colored lines and track the now distorted grid lines to check the thermoforming process.



Ajile built a complete inspection cell with a turntable to rotate the liners in front of a gantry which holds two DepthScan color-capable 3D cameras.

A set of over 5000 individual image captures are then processed and stitched together to form a complete point cloud and then aligned to the CAD model of the liner.

The colored grid lines are isolated and used to create a series of polylines on the surface to compare with the designed ideal positions.

The intersections of the grid lines provide a direct representation of the drift of the liner from the ideal.

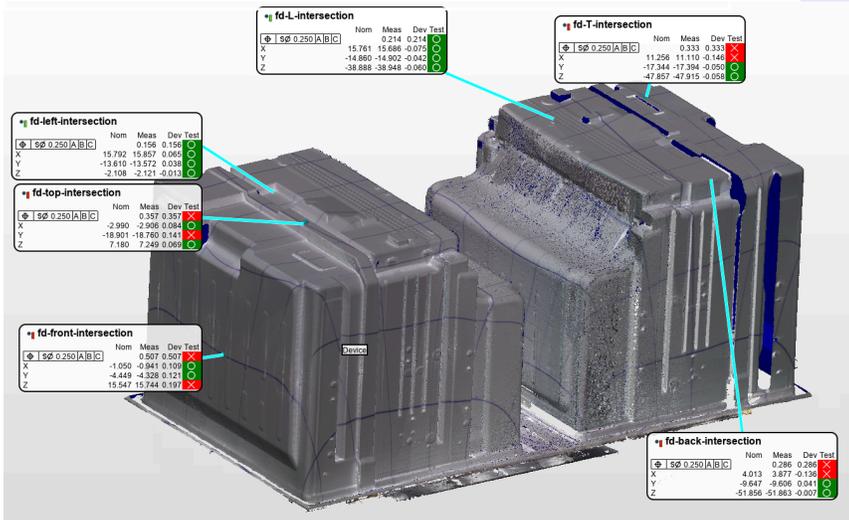
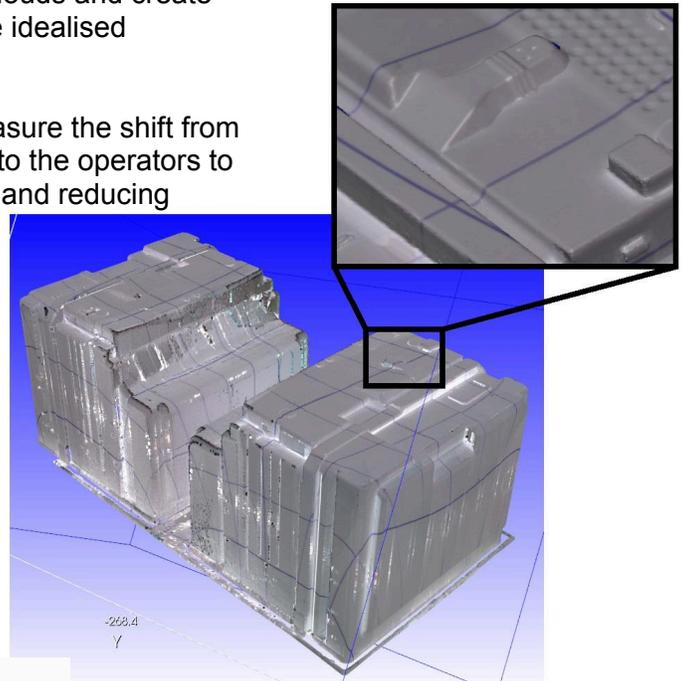


In addition to designing and building the system hardware, Ajile developed custom software to extract the colored lines from the point clouds and create polylines that can be further processed and compared to the idealised versions.

One way is to find the intersections of the grid lines and measure the shift from the idealised values. This can then be displayed as a guide to the operators to fine-tune the thermoforming process, thus improving quality and reducing waste.

Working with Polyworks allows the positions of the intersections of the grid lines found from the imaging to be compared to that found by CMM on specific liners, allowing the accuracy of the system to be determined.

This shows that the positions of the points can be determined within the required 0.250" true position.



Ajile's DepthScan camera provides accurate 3D images in full color, can work over a large working volume and has optional auto-focus and auto-iris features.

Ajile provides complete inspection solutions including turntables and robotic part handling. The Ajile software manages capture, filtering, stitching, surfacing and analysis. We also integrate smoothly with 3rd party software such as Polyworks, providing seamless automated inspection solutions.