

<u>Genesis Case Study #:</u>	J7873-002
<u>Application:</u>	Robotic Ultrasonic Non-Destructive Inspection (NDI)
<u>Market Segment:</u>	Aerospace
<u>Product:</u>	Carbon Fiber (Thermoplastic) Aircraft Clip
<u>Cycletime:</u>	< 3 Minutes



Summary

Composite "clips" are loaded manually into the fixture nests on one of two drawers. The nests and product sheet bar codes are manually scanned, and the drawer is closed. The cycle start button is pressed, and the robot picks the first part in the drawer. The system PLC triggers the InspectionWare acquisition software to commence an inspection, and the appropriate UT process configuration is selected within the FlawInspecta high speed ultrasonic array imaging system. The robot manipulates the clip in front of a 64-element linear array operating in pulse echo until 100% of the part has been scanned. The robot replaces the clip into the nest from which it came, and the inspection data is saved to the plant network for analysis by a certified inspector at a remote workstation. Throughout the processing of the production parts, a timer will be monitored by the PLC to trigger automatic scanning of reference standards per OEM requirements.

Project Challenges

- Low volume, high mix production (> 650 unique parts per ship set)
- OEM specifications for NDI
- Cycle time limit of 3 minutes per part
- Collection and presentation of full waveform data such that it can be quickly evaluated

Genesis Solution

- NSpect 210 robotic NDI system (2 station, 1 robot, zero auxiliary axes)
- KUKA KR60 HA robot with vacuum end-of-arm tooling
- FlawInspecta ultrasonic system by Diagnostic Sonar
- UTEX InspectionWare Acquisition and Analysis software
- Immersed 64-element linear array operating in pulse echo (PE)
- Tooling and Fixtures by Genesis Dimensional & Tooling Solutions