

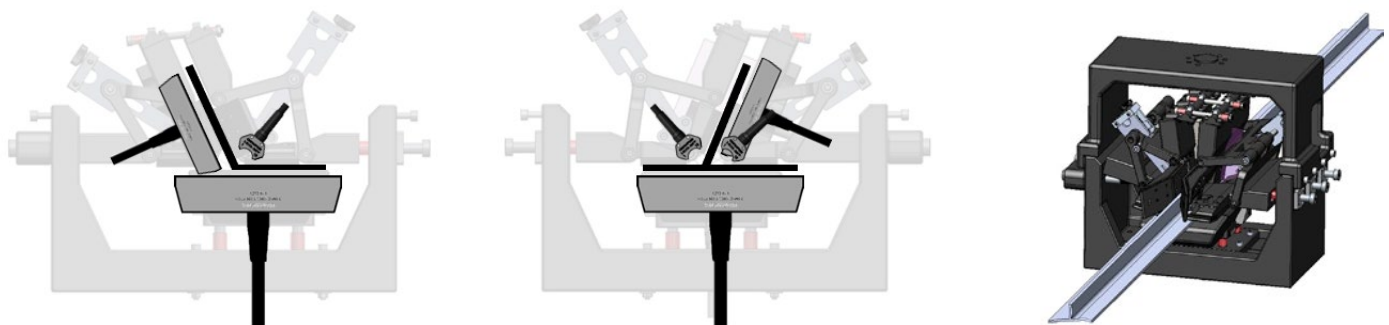
Aircraft Structural Component Inspection System



The structural components in current aircraft designs are typically made of lightweight, high-strength carbon fiber composites, although older designs in production may still use aluminum. The elongated structural profiles in wings, horizontal stabilizers, vertical fins, and fuselages can be manufactured in a variety of cross-sectional profiles, including but not limited to L, T, and U shapes. After the manufacturing process, parts are inspected for potential flaws before they are assembled. Phased array (PA) ultrasonic testing is widely used for full volumetric inspections that can locate delamination, voids, porosities, and foreign matter in composite materials, as well as aluminum components.

Automated Robotic Component Inspection

This system's inspection head contains PA probes and self-adjusting guides that adapt to securely fit around the profile of a component submerged in a water tank. A robot mounted on rails moves the inspection head along the full length of the component, which is held by supports that move to provide clearance when the head passes. PA beams from curved and linear PA probes provide full inspection coverage of a profile in a single or double pass of the inspection head.



The inspection head design can be adapted to fit different profiles, with flat probes used on the flange or web and a curved probe in the corner. Depending on the profile geometry, a second curved probe may be added to enable full inspection in a single pass—for example, on a T-profile.

Turnkey Component Inspection Solution Features



- The inspection head with its adjustable, tapered opening guides itself onto the component and automatically aligns the probes to different angles, radii, and geometries.
- Components are vacuum held on retractable supports that lift out of the water automatically, within easy reach of operators for loading and unloading.
- Depending on the geometries being inspected, required inspection heads are automatically changed.
- The standard industrial robots are proven, durable, and simple to program and operate through an application-dedicated motion interface.
- The central operator station contains all system controls, which are integrated with FocusPC software for data collection and analysis.
- FocusPC software displays A-scans and C-scans in real time and enables continuous scanning of large parts without stopping the inspection movement.
- Coherent adaptive focusing (CAF), a feature of FocusPC software, dynamically adapts ultrasonic waves for radius inspections.

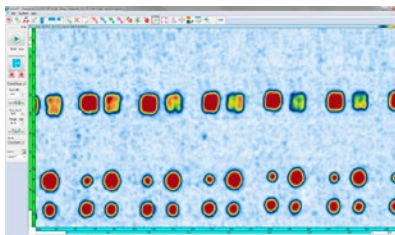
System Performance

Inspection, calibration, and calibration-check user-configurable reports	Geometry	L -T -U profiles
	Size	Client specified, typically, 0.6 m–20 m (1.9 ft–65.6 ft) long profile, 25 mm–100 mm (0.9 in.–3.9 in.) high, 50 mm–115 mm (1.9 in.–4.5 in.) wide
	Speed	Up to 150 mm/s (30 ft/min) Scan time example: 40–80 s for a 6000 mm (19.7 ft) long part
	Coverage	100% of product volume along full length, using multiple probes for corners and surfaces
Data Presentation	Real-Time Inspection Results	A-scan, B-scan, C-scan, and D-scan
Inspection Modes	Typical Inspection Modes	Longitudinal, volume inspection
Inspection Temperature		Normal operating range: 5–40 °C (41–104 °F)
Detection Capabilities for Typical Reference Defects	Repeatability	Typical reference defects according to industry-required standard and probe type.
Reporting and Data Storage	Report Types	Inspection, calibration, and calibration-check user-configurable reports
	Storage	Data storage in .fpd files accessible via FocusData library

This solution is powered by



FOCUS PX Acquisition Unit



FocusPC Software



Olympus PA Probes

www.olympus-ims.com

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For inquiries - contact
www.olympus-ims.com/contact-us

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