

GE  
Measurement & Control

# Hydrastar

Robotic Ultrasonic Solutions  
for Composites Inspection



# Flexible, High Throughput Systems for Composite Inspection

Hydrastar is GE's robot based automated ultrasonic platform for the inspection of complex composite aerospace structures. Hydrastar systems are complete turnkey solutions available in single and dual robot configurations with optional linear slides and turntables to inspect a wide variety of component geometries.

The Hydrastar design incorporates several GE patented technologies including wide area phased array squirters and reverse phasing surface adaptation. The result is industry leading productivity.

## Hydrastar Configurations

Hydrastar systems are available in a wide array of constructions for specific customer application needs.

The operator can choose from a variety of phased array and conventional ultrasonic application tools to efficiently conduct pulse echo or through transmission testing of both planar and complex three dimensional composite parts.

The Hydrastar dual configuration consists of two robots mounted on linear slides that can operate in GE's patented synchronous motion\* for TTU inspection or be controlled independently for Pulse Echo applications.



The Hydrastar single configuration consists of one robot mounted in either a fixed location with a turntable or mounted on a linear slide employing a yoke tool for TTU inspection and a complete set of pulse echo application tools.



## High Throughput Application Tools



### Conventional TTU Squirters

Dual frequency inspection in a single pass using GE's annular ultrasonic transducer design achieving twice the throughput of conventional single channel squirters.



### Wide Area Phased Array TTU Squirters

GE's patented Phased Array squirters provide up to a 15 mm wide scan area in a single pass, increasing productivity up to 8 times compared to conventional ultrasound.



### Phased Array Skin Bubbler

Pulse Echo inspection with up to a 38 mm track width in a single pass. Adaptable to changing surface geometry via GE's patented reverse phasing surface adaptation method that increases productivity up to 20 times compared to conventional ultrasound.



## Hydrastar Delivers:

- Industry standard robots with global service and support structure
- Industry leading application tooling for high throughput pulse echo and through transmission scanning.
- Common ultrasonic instrument and software platform for conventional and phased array ultrasonic testing
- Outstanding, high dynamic range ultrasonic testing performance
- Simple operation by a single operator
- Advanced software tools for inspection analysis and automated report generation.
- Semi-automated application tool selection and attachment to the robot



**Phased Array Inside Radius Bubbler**

Inspects internal radii in a single pass adapting to geometry changes using GE's patented reverse phasing contour adaptation method.



**Phased Array Outside Radius Bubbler**

Inspects external in a single pass radii adapting to geometry changes using GE's patented reverse phasing surface adaptation method.



**Phased Array Stringer Bubbler**

By clamping onto the stringer section, this tool inspects T-shaped stringers in a single pass.

**\*U.S. Pat No. 8,833,169**

**\*UK Pat No. 2497418B**



## Advanced Application Software

GE's NuScan data acquisition and analysis software is the central hub that controls the entire ultrasonic inspection process providing the following functions.

- Geometric teach in from CAD models, Laser metrology and manual methods
- Control of scan trajectories
- Real time acquisition and mapping of ultrasonic data for individual parts or collection of parts in a single scan
- Manual and Assisted Defect Recognition and automated inspection report generation

## Application Development and Validation Support

Proper development and validation of the ultrasonic application for a given part is critical to the success of any complex part inspection. To support our customers, GE has invested in a full sized Hydrastar system in its Technology Support Center. The center is open to our customers for application development, inspection validation and hands on training on advanced non-destructive testing topics.



Imagination at work

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