

# Phased Array Composite Inspection



- Fast
- Greater probability of detection
- Optimum near-surface resolution
- Portable and easy to deploy
- Excellent coupling
- Versatile software

# Composite Inspection Solution

Parts made of laminated composite materials are challenging to inspect. Whether for manufacturing or maintenance, these inspections involve complicating factors such as large surface areas, varying thicknesses, attenuation, and defects that are located just below the surface. The Olympus Composite Inspection Solution provides a complete set of tools that simplify the inspection of composite parts, including skins, stringers, and spars.

The solution includes the OmniScan™ flaw detector, GLIDER™ scanner, RollerFORM™ wheel probe, and Mini-Wheel™ encoder along with probes and wedges designed for inspecting flat and curved parts. Advanced features include two-axis encoded C-scans with amplitude and time-of-flight (TOF) information, gate synchronization, and data recording.

This solution covers a range of applications in the aerospace, wind turbine, and automotive industries and is used to quickly identify subsurface delamination, disbonds, porosity, or inclusions. A variety of scanners make this solution adaptable to different types of inspection.

## Semiautomated XY Mapping

### GLIDER Scanner

High-Precision Inspection

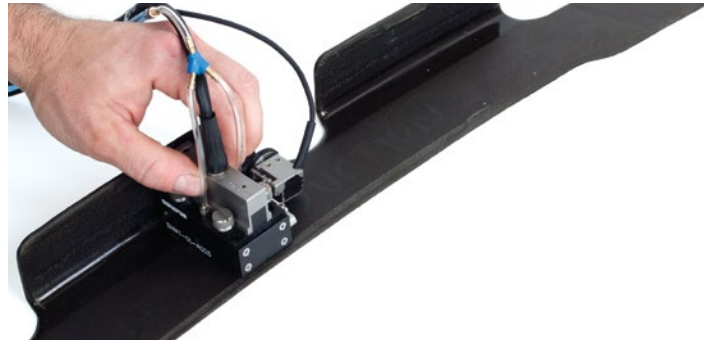


When completely mapping large surfaces, the GLIDER scanner is used for accurate XY positioning during phased array or conventional ultrasonic testing.

## Manual Encoded One-Line Inspection

### Mini-Wheel Encoder

Small Footprint for Small Parts



For difficult-to-access areas, such as stringers or spars, the Mini-Wheel encoder can be attached directly to the probe to achieve the smallest footprint.

## Immersion-Like Acoustics

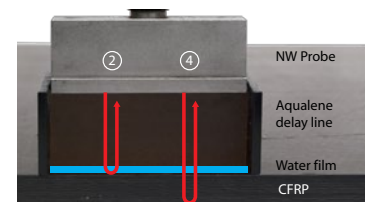
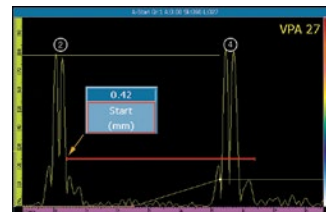
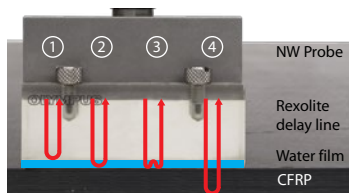
The Olympus Aqualene wedges and RollerFORM wheel probe provide exceptional coupling and enhanced near-surface resolution. Both permit the use of an immersion-type setup, which enables synchronization of the measurement gates with the front wall echo, simplifying signal interpretation with more consistent C-scans. Test repeatability is improved, increasing the inspection rate.

Aqualene wedges are available for NW1, NW2, NW3, and I5 phased array probes. NW wedges can be ordered with an optional water recuperation system (WR option) for improved contact on irregular surfaces and minimum water loss.

- Optimum near-surface resolution.
- Improved repeatability.
- Gate synchronization with the front wall.
- Eliminates wedge interface echo and water-gap reflection.

## Aqualene Versus Rexolite® Wedges

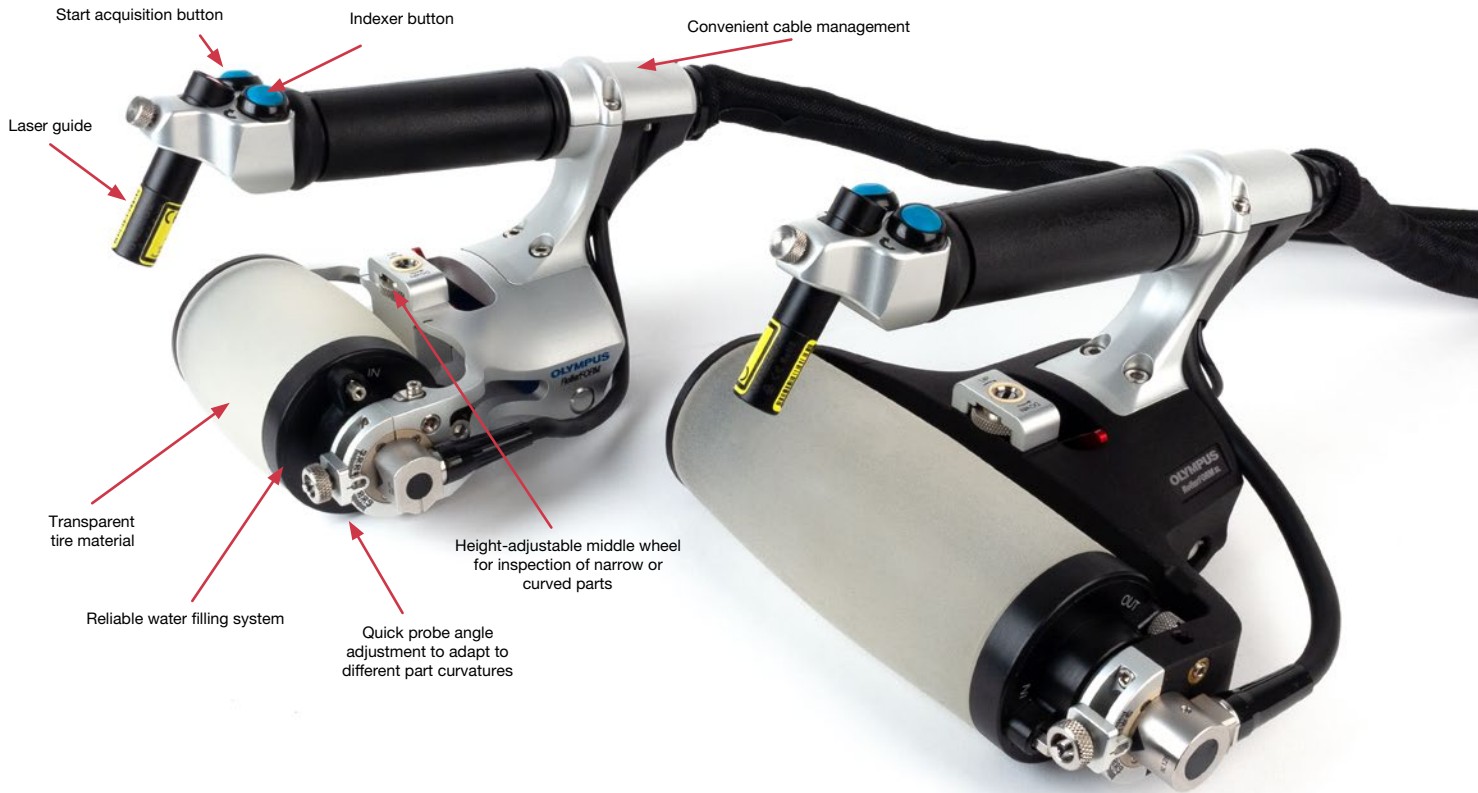
The reduction in interface echo provided by Aqualene wedges contributes to an improvement in near-surface resolution of up to 50% by enabling you to position the measurement gate closer to the interface.



## One-Line Encoding and Indexing Scanners

### RollerFORM™ and RollerFORM XL Wheel Probes Ergonomic Inspection of Flat or Curved Surfaces

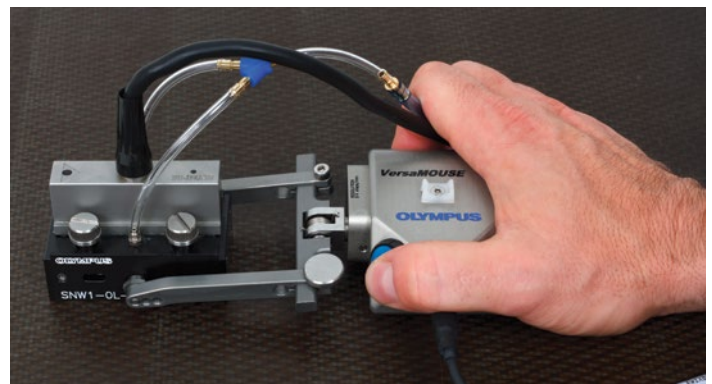
In addition to providing exceptional coupling, the RollerFORM wheel's tire is made of a unique material that closely matches the acoustic impedance of water, a design feature that helps ensure optimum data quality. The tire material is transparent so that you can easily identify the presence of air bubbles or contaminants within the water chamber. The RollerFORM scanner can easily be used to perform 2D mapping C-scans thanks to integrated features such as an indexing button, start button, laser, and encoder.



### VersaMOUSE™ Scanner Cost-Effective Inspection of Flat Surfaces

When limited space is a factor, the VersaMOUSE scanner is an economical, complimentary tool to the GLIDER scanner. The VersaMOUSE scanner is capable of performing 2D mapping of much smaller parts and areas. When compared to the Mini-Wheel encoder, the VersaMOUSE scanner offers many additional features.

- Integrated indexer button enables fast 2D mapping.
- Maximum wheel adherence.
- Easy probe installation using the adjustable yoke.



### 2D Mapping with Indexing Function

The integrated indexer button on the VersaMOUSE scanner and RollerFORM probe makes 2D mapping as easy as a click of the thumb. You simply perform an encoded one-line scan, then press the button to index the position in the perpendicular direction. When the next one-line scan is performed, it is automatically juxtaposed to the previous scan in real time on the instrument's display. This process is repeated to produce a complete 2D map of the area of interest.

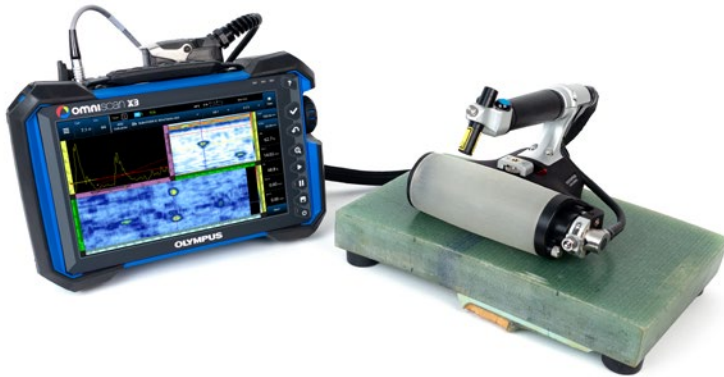
## OmniScan MXU Acquisition Software

The OmniScan™ MXU software has a full range of tools and displays for composite inspection applications:

- Three gates for different amplitude and TOF information.
- Different gate synchronization capabilities.
- Customizable C-scan color palette.
- Two-axis encoding capabilities.
- A-scan/C-scan data storage and post-processing capabilities.

## Wind Blade Inspection Solution

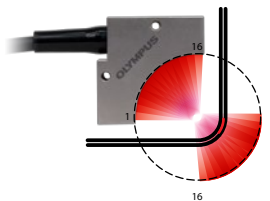
The Olympus wind blade solution enables users to inspect blade spar caps and shear web bonding made with thick, attenuative materials, such as carbon fiber (CFRP) and glass fiber (GFRP). With wider coverage than conventional ultrasonic testing (UT), this phased array probe solution makes these challenging inspections easier with improved scan speed, increased data point density, reliability, and comprehensive imaging.



OmniScan X3 instrument with RollerFORM™ XL phased array wheel probe on a wind blade spar cap sample

## Radii Inspection Solution

Olympus also offers a solution for the inspection of composite radii. This solution features appropriate holders and curved linear arrays that cover the entire corner in a single pass. The geometry of the probe enables all of the ultrasonic beams to coincide at 90° with the surface of the corner in a manner similar to flat-surface inspection. This radii inspection is performed in water immersion, either from the inside or the outside of the radii, depending on the shape and size.



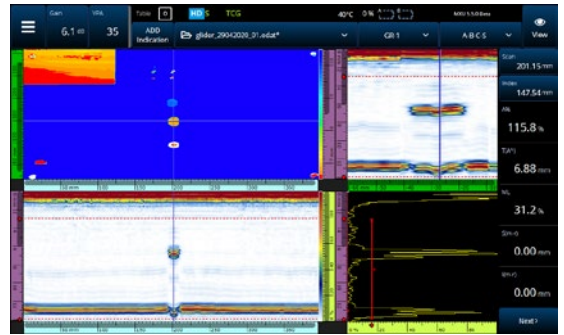
Information on probes and holders can be found in the *Phased Array Probes and Wedges* catalogue.

[www.olympus-ims.com](http://www.olympus-ims.com)

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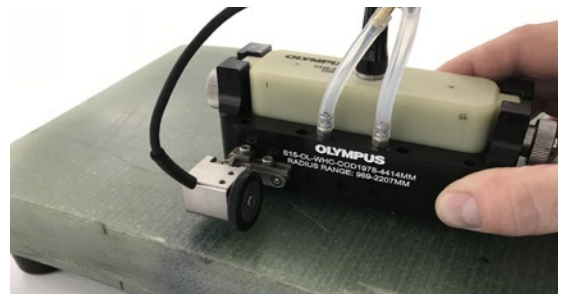
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OmniScan X3 interface showing A-B-C-S view of a composite sample



GLIDER semi-automated 2 axis scanner inspecting a wind blade



15 phased array probe and SI5 holder with a Mini-Wheel™ encoder for one line encoded scanning



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