LaserUT® NDT System

LaserUT® NDT System is a patented technology, initially developed for the Joint Strike Fighter (F-35), which revolutionizes the process of ultrasonically inspecting composite parts.

The LaserUT® NDT System is optimized for the inspection of complex contoured composite structures such as fuselage stringers and parts with tight radii. Its flexibility allows for the inspection of everything from large fuselage sections to small detail clips. Its speed, along with reliability and ease-of-use, addresses the growing bottleneck posed by NDT in most aerospace manufacturing facilities. Its software automates many tasks, creating an environment that produces operator independent data. The result is a system whose NDT cycle time is up to 10x faster than most conventional UT NDT systems.

The LaserUT® system is the most versatile NDT system available with the highest throughput rate and the lowest total cost of ownership in the industry.

### LaserUT® NDT Benefits

- Reduces cycle time by scanning up to 10 times faster for complex composite structures to reduce capital expense
- Significantly reduces setup time and part positioning to increase throughput
- No special tooling, fixtures or material handling required for each part minimizing part damage due to handling
- No special foundation or water circulation system required to reduce total project time and reduce facilities cost
- Elimination of alignment steps through simple, one-time part teaching process
- Eliminates CAD data requirements for part teaching process
- Consistent results are operator independent with minimal training (less than 40 hours)
- Only factory UT technology that could support future MRO activity using digitally archived data
LaserUT® NDT System

LaserUT® NDT System Features

- Compatible with most polymer-based laminated composites
- Display traditional A, B, and C-Scan outputs
- Real-time scan display
- Automated, full waveform data collection and archiving to enable data retention for life of aircraft
- Scan plan creation and management tools to simplify and expedite teaching process
- Data slicer evaluation tool for providing CT scan style analysis
- Inspection setup tolerance has a maximum angle of incidence ±45 degrees
- Ultrasonic setup uses automated control with no user adjustments
- No custom fixtures required, can be used in transportation cart.
- Variable setup indexes
- Operator comments/annotations/mark up tools
- Remote diagnostics for tech support available

LaserUT® NDT System Specifications

Generation Laser

- Generation Laser System: CO2
- 600Hz Standard Rate Laser
- Optional 200Hz, 400Hz and 1000Hz lasers available

Laser Delivery System

- Simple multi-axis motion control design positions the scanner
- Repeatability: < 2mm (0.08in)
- Accuracy: < 6mm (0.24in)

Scanning

<table>
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<tr>
<th></th>
<th>200Hz</th>
<th>400Hz</th>
<th>600Hz</th>
<th>1000Hz</th>
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<tbody>
<tr>
<td></td>
<td>2.9m²/hour (32ft²/hour)</td>
<td>5.7m²/hour (64ft²/hour)</td>
<td>8.6m²/hour (96ft²/hour)</td>
<td>14.4m²/hour (160ft²/hour)</td>
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- Step Index: 1mm (0.040in) – 2mm (0.080in)
- Custom step index options available
- Laser Spot Size: ~5mm (0.20in) diameter at 1.8m (6ft)
- Single Area Coverage: 1.3m (4ft) x 1.3m (4ft) at 1.8m (6ft)
- Depth of Field: > 0.5m (1.5ft)

Data Acquisition, Display, and Storage

- Data Acquisition: Full waveform capture with 100% data retention
- Data Display: A, B, and C-Scan images, advanced data analysis tools
- Data Archive: Automated data archiving, transparent to system operator
- Database: Operator search, sort, and retrieval of data
- Integrated audit trail capability

Detection System

- Detection Laser System: Nd:YAG
- Trace Laser System: 532nm and 632nm
- Interferometer: Dual Differential Confocal Fabry-Perot
- Signal Bandwidth: 0.5MHz – 15MHz typical
- Ultrasonic Setup: Automated control, no user adjustments required

Materials, Shapes and Part Fixtures

- Material Compatibility: Most polymer-based laminate composites
- Part Shapes: Flat to complex contoured, requires line-of-sight access
- Part Thickness: Up to 50mm (~2in) thick, material dependent
- Part Fixture: No custom part fixture required

Calibration and Maintenance

- Calibration: “Standardize Prior to Use” with reference panel
- Generation Laser Scheduled Maintenance Interval: 10⁹ shots or 1 year