



Aerospace Ultrasonic Phased Array Inspection Course Outline

- 40 hour (1 week) course for aircraft inspectors already certified level 2 or 3 in conventional ultrasonic inspection of aircraft and needing to progress into phased array inspection.
- Suitable for aircraft manufacturers, engine manufacturers, aircraft operators and Space and Defense personnel.
- Formal classroom theory sessions covering, comparison of conventional ultrasonic theory and phased array theory and techniques, familiarization with the OmniScan® operation, current aircraft applications including: composites, metal/metal bonding, friction stir welding, fastener hole inspection, billet inspection, landing gear inspection.
- Structured hands-on practical exercises using the OmniScan® on our range of aircraft defect samples (Please feel free to also bring your own samples).
- Technique development training and set-up optimization.
- Software manipulation for imaging, data storage and set-up storing.
- Qualification examinations can be administered on course completion by prior arrangement.

CONTENTS

- 1.0 Introduction / Course objectives
- 2.0 Ultrasonic signal digitization concepts
- 3.0 Phased Array principles
- 4.0 OmniScan orientation and basic operating instructions
- 5.0 Modern aircraft materials and manufacturing processes and possible discontinuities, an overview
 - 5.1 Carbon Fiber Composites
 - 5.2 Glass reinforced Plastics
 - 5.3 Metal/Metal Bonded Structures
 - 5.4 Friction Stir Welding
 - 5.5 Corrosion
 - 5.6 Fatigue Cracks
- 6.0 Current Aerospace / Aircraft phased array applications
 - 6.1 Composite Inspection
 - 6.2 Corrosion Inspection
 - 6.3 Landing Gear Inspection
 - 6.4 Fastener Hole Inspection in Thick Aluminum Skins
 - 6.5 Metal / Metal Bond-line Inspection
 - 6.6 Laser Welding Inspection



- 6.7 Friction Stir Welding
- 7.0 Calibration specimens for aircraft ultrasonic inspection
- 8.0 Technique development for optimized aircraft / aerospace inspections
 - 8.1 General user information
 - 8.2 Basic connections and powering up
 - 8.3 Probe / Part calibration
 - 8.4 PGM probe calibration
 - 8.5 UT calibration
 - 8.6 Display selection
 - 8.7 Sound velocity calibration procedure
 - 8.8 Element sensitivity calibration procedure
 - 8.9 Wedge delay calibration procedure
 - 8.10 TCG (Time Corrected Gain) calibration procedure
 - 8.11 Encoder calibration procedure
 - 8.12 Flaw sizing procedure
 - 8.13 Creating a report
 - 8.14 Storing the set up file
 - 8.15 Creating a defect table
 - 8.16 Worked class example of procedure preparation – CFC inspection with a linear electronic scan.
- 9.0 Data storage / manipulation / evaluation (Sizing) and report writing
- 10.0 Conclusions
- 11.0 Appendices

Practical exercises using pre-programmed set-up files

Glossary of terms

Acoustic Properties Table

Direct access “Function Key” definitions

Listing of available R/D Tech UT PA probe properties

TEST NDT does not have any pre-requisites for attending any of our courses, it is entirely up to the attendee to determine whether the course is suitable for their needs and whether they are capable of achieving the standards. Please study the applicable course outline and decide if the course is suitable for your needs before enrolling, if in doubt, please contact us to discuss. For employer funded attendees, please discuss the suitability of any of the courses with your employers responsible NDT level 3 before enrolling.