

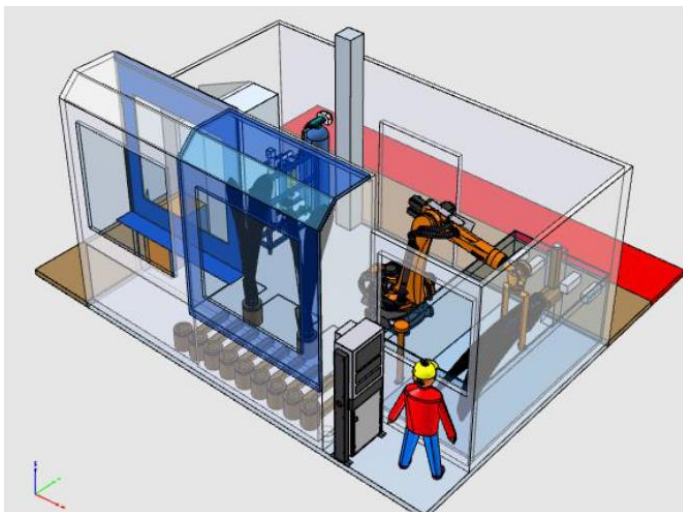
Automated Ultrasonic Blade Inspection

TD NDE offers a turn-key automated system for blade inspection.

An immersion tank is installed near a 6 axis robot. The robot is responsible to move the blades from their rack into the tank and to follow a scan path using different type of transducers and holders.

The inspection system is designed to inspect composite blades for defects and titanium. It inspects disbonding, delamination, foreign material and crushed core/foam/honeycomb.

The system comes with all the necessary hardware and software and includes delivery, training and support. It's fully automated from inspection to part evaluation.



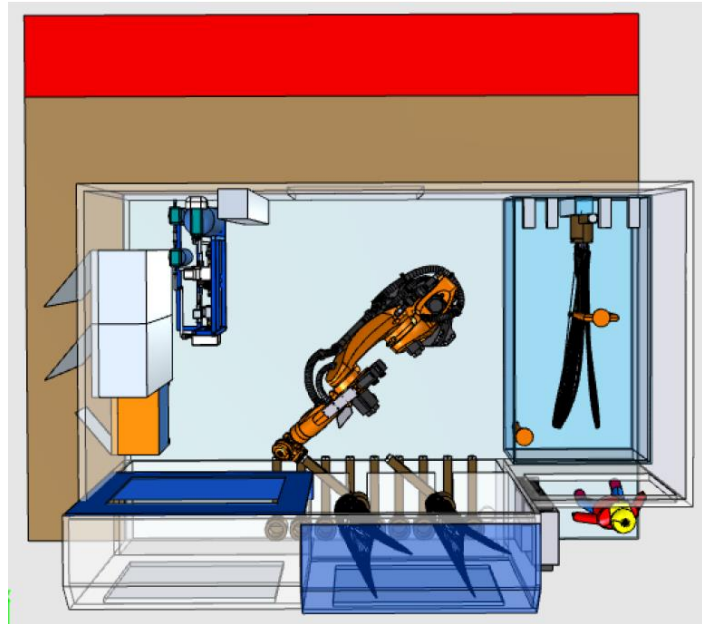
Solution:

- Designed for CFRP and metal part inspection
- Scan paths adapted to all shapes
- 100% Inspection
- Phased Array, Pulse Echo, Immersion
- Immersion Conventional Transmission
- Time-of-Flight and Amplitude C-Scans
- A scans as required
- Water tank sized to immerse the blades
- Mechanic to support the blades and to move them during inspection.
- 6 axis robot able to move around the blades and support the UT probe holders
- CNC controller
- UT instrument
- UT software

System Description : Hardware/Software

Inspection cycle

- The operator launch the cycle by scanning the part number. The system calls up the appropriate motion inspection set-ups program.
- The robot gets the blade located in a rack and moves it into the tank.
- The probe holder is fixed on the end effector of the robot.
- The robot scans the blade. Different types of scans are done depending on the defects to find.
- All scans are saved on a PC.
- Automatic analysis, inspection rapport.



Tank

A stainless steel tank is designed in function of the blade dimensions.

Filtration unit

A filtration unit is link to the tank to keep the water clean, free of air bubbles and at the same temperature (22°C).

- Installed at the back of the system
- Includes output to connect to main facility drain
- Paper Cartridge Filter
- Water Heater

6 axis robot

The robot is responsible to move the blades around the system, from the rack to the tank. It is also used to scan the blades. The robot is equipped with a touch probe. The probing of 3 reference points with a touch probe makes it possible to readjust the workspace coordinates system according to the actual position of the blade inside the tank compare to the scan program.



System Description : Hardware/Software

Enclosure

The entire system is inside a protected zone made out a plastic windows and walls. The rack where all the blades are in standby position is also located inside this enclosure.

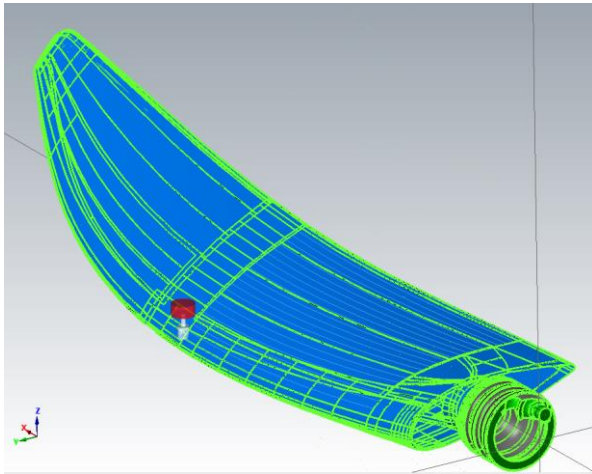
Ultrasounds

The ultrasound module is composed of:

- UT instrument
- Probes
- Acquisition software
- Supervisor software
 - Scan management
 - Uploading scan path, UT setup and new product.

Scan paths

3D model for all the blades are used to create the scan paths with Mastercam.



CNC and operator station

The robot and the entire process can be control by a Siemens 840DSL controller.

Electric cabinet

All electrical wires are wired and interconnected in close and locked electrical cabinet.

Acquisition PC

- 21 inch monitor on a stand
- Windows 7
- 2.8 GHZ Processor
- 8 GB DDR memory
- 500 GB hard drive



OPTIONS

ULTIS Analysis software. A powerful composite analysis software for defect analysis and automated inspection loaded with composite related NDT tools.

Database Integration to facility