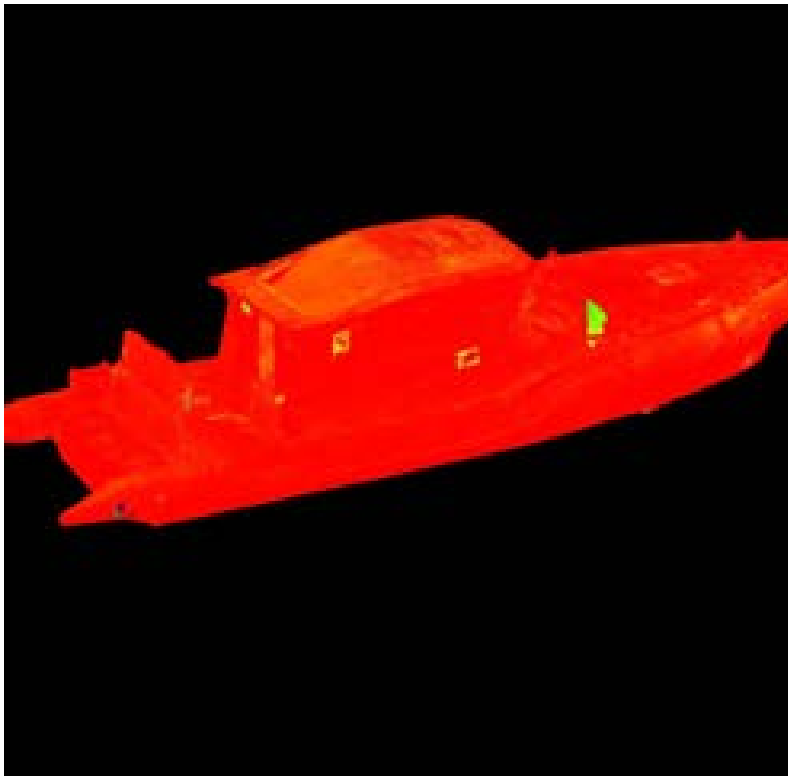


APPLICATION NOTE / MARINE

Stay at the forefront of inflatable boat design

Overview

Inflatable boats and super yachts manufacturers always strive for perfection. For this reason, 3D laser scanning technology is the key that helps in every phase of a model's construction and future-proofs any further design and development of this model. As all the boat parts can be reversed-engineered, manufacturers have the luxury of sending newly designed parts to third-party companies where the plugs can be cut using CNC milling machines. In this way, the production of parts is more time and cost-effective.

In this case, the METRICA team performed 3D Scanning measurements of an inflatable boat, air cushions, deck, bridge, bottom part, chairs, roof rack, and other components. Then, we created the final 3d mesh delivered in .stl format using the dense point clouds.

Indicative Deliverables

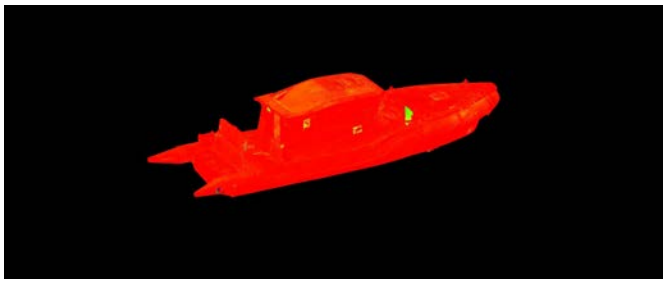
- Demonstration in 2D, 3D or VR
- 3D Point clouds in Real Color
- 2D CAD Drawings- Cross Sections- Horizontal/Vertical Sections
- 3D Digital Models

Benefits

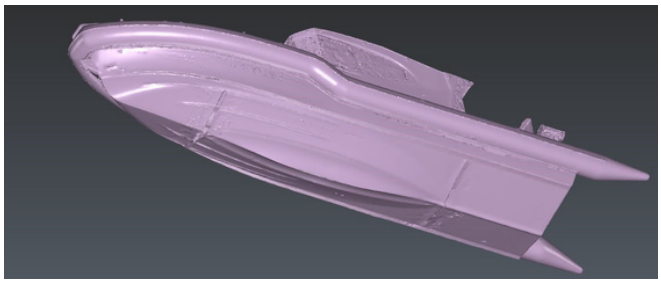
- Time-saving
- Increased productivity
- Less rework
- Cost reduction

LEICA RTC360 LASER SCANNER

The Leica RTC360 3D reality capture solution empowers users to document and capture their environments in 3D, improving efficiency and productivity in the field and in the office through fast, simple-to-use, accurate, and portable hardware and software.



Final unified point cloud



3D mesh inside Leica 3DR

Methodology

The whole measurement procedure lasted a single working day. Before the scanning procedure, our team defined the following:

- the proper route of scanning setups
- the resolution
- the quality levels
- the production of final deliverables

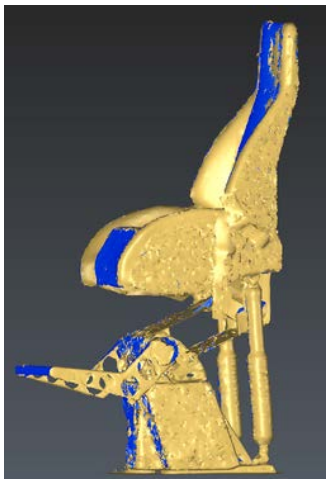
The project was covered through 62 laser scanner setups.

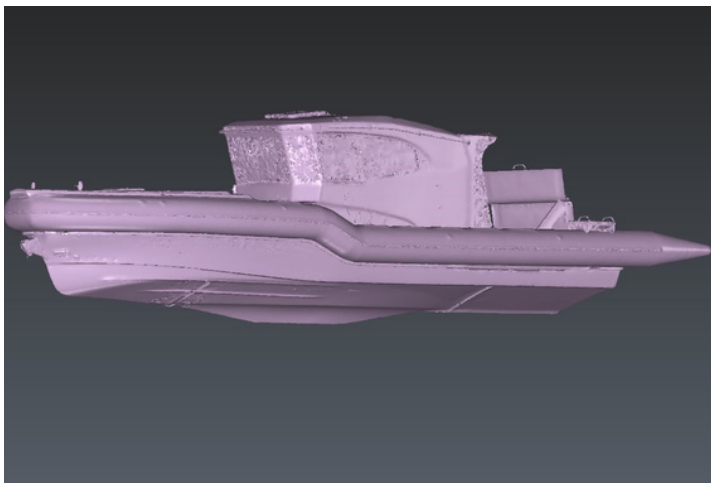
All point clouds were registered and cleaned from irrelevant objects on Leica Cyclone Software. For registration purposes, there were used cloud and target constraints. The mean absolute error for all registrations was 1 mm, and the max constraint error vector was 4 mm. Despite the valid registration results, we visually checked point clouds for possible residual errors. After the registration process and visual inspections, all point clouds were decimated and unified into a final point cloud which served as the base for further processing.

After a discussion with the naval engineer, the unified cloud was aligned to the best approximate coordinate system inside the Spatial Analyzer metrology platform.

After the definition of the UCS and the alignment of the point cloud, we created the mesh from the aligned point cloud utilizing Leica Cyclone 3DR software. The 3D unstructured mesh was inspected for topological errors.

The same procedure was conducted for the chairs, the roof rack and the equipment (Pictures 7, 8). All deliverables were exported to. stl format as requested.





3D mesh inside Leica 3DR

Instrumentation / software

Leica RTC360 Laser Scanner
Leica Cyclone
Leica 3DR
Spatial Analyzer

Deliverables

- 3D mesh
- Sections, buttocks and waterlines in .stl and .dxf file format.