

Detroit Engineered products (DEP), is an engineering services, product development, software development, consulting and talent acquisition company. Since its inception in 1998 in Troy, USA, DEP is now a global company with footprints in Europe, China, Korea, Japan, and India. DEP uses the accelerated and transformed product development process, accomplished by utilizing our proprietary platform, DEP MeshWorks, which rapidly reduces the development time of products for all segments. The MeshWorks platform delivers tool sets that accelerate virtual validation activities associated with powertrain development across all stages for both conventional and electric powertrain.

Latest MeshWorks, features modules and tools that adds substantial depth and robustness for FE/CFD pre & post processing and customizable engineering process automation environment, all in an easy to use graphical interface. Tools like rib addition, feature removal, model checker, fuse welding, wall thickness reduction options, design space building tools and other model assembly tools have accelerated the way engineers perform model changes for what if studies and optimization.

MeshWorks core integral pillar are its main differentiators, the integrated modeler, parametric modeler, associative modeler and automated modeler. The benefits of these core functionalities are reduced CAE model building time upto 40 to 50%, 2x to 10x time reduction for all processes, performance improvement, design optimization, weight reduction, etc.



Smarter solutions. Realized.



MARINE SOLUTIONS

Global Model:

- Parameterization
- Global Modes
- Strength
- Optimization

Powertrain:

- Performance optimization of complete PT and its components
- Mass efficiency strategies

Critical Connections:

- Connections Modeling

Supporting Structures

- Stress, deformation & yielding
- Buckling

CFD based Hull Shape Optimization:

- Global Strength
- Longitudinal Strength
- Beam Strength

Vibration Acoustics:

- Vibration Analysis
- Torsional
- Axial
- Torsional- Transient & Steady state
- Due to cylinder misfire

Powered by **DEP MeshWorks**

Success Story

Aluminum bulkheads converted to composite bulkheads, with performance improvement, and a mass savings of 28%

The Client:

The client is a one of the world's largest composite manufacturer

The Challenge:

The end customer had been using Aluminum bulk heads, and wanted DEPs help to evaluate other composite materials that could be used without compromising on performance. While aluminium was light, the client was looking for structural integrity and even lighter material at an optimum price point.

The Solution:

DEP worked closely with the partner's materials team and identified two possible options that could be evaluated- a glass fiber composite, and a carbon fiber composite. The proposed material was tested thoroughly against the aluminum bulkhead.

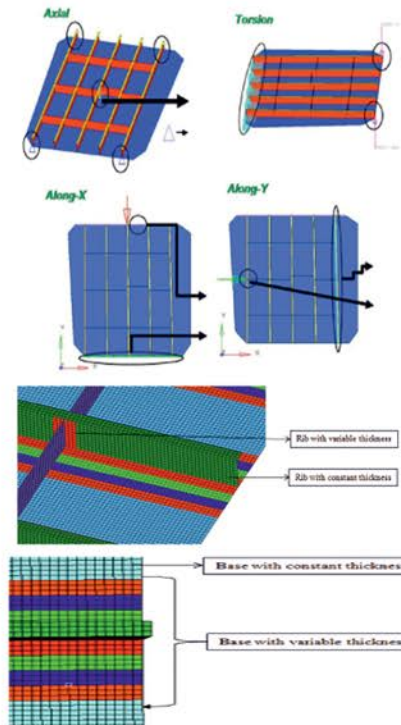
Based on discussion with end customer, DEP Engineers came up with loading scenarios to establish the baseline performance for Aluminium bulkhead. Similar loading scenarios were used to analyze composite bulk head design proposed.

For ease of manufacturability, the rib and base was configured and evaluated, with variable and constant thickness to increase stiffness and overcome manufacturing constraints.

The Depth of the web and number of ply was adjusted to reduce displacement due to torsion.

The Result

The DEP team was able to reduce the mass by 28 percent, with an improvement in performance, and was able to convert Aluminium bulkheads into a composite bulkhead to gather same level of stiffness.



- CAD Modeling
- Ship configurations
 - Tankers
 - Bulk Carriers
 - Container Ships
 - Ocean Liners
- Modeling of Critical Areas
 - Connections
 - Openings
 - Bracket Toes
 - Structural Knuckle Points

- Primary, secondary, tertiary bending on Global FE Models.
- Stress and deformation of main supporting members for yielding & buckling
- Large Models handling
- 3D Models from 2D drawings
- Beams & Shells concept models

- Bulkhead Stress Analysis
- Weight Optimization
 - Alternate Configurations
 - Alternate Materials – Composite
- Global ship model analysis for sagging
- Parameterization, morphign & optimization

- Acoustic Cavity Model Building
- Vibroacoustic Analysis
- Structure-Acoustic Coupling
- Forced Frequency Response
- Acoustic Response