

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

About 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.

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