



LMW LEVERAGES SIMULATION FOR NEW PRODUCT DESIGN

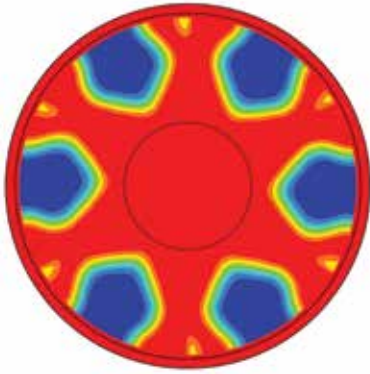
About the Customer

Lakshmi Machine Works (LMW), founded in the year 1962, today is a global player and one among the only three manufacturers of the entire range of textile machinery in the world. The company has diversified into Computer Numerically Controlled (CNC) machine tools and is a leader in manufacturing customized products for OEMs. The LMW foundry manufactures precision castings for industries the world over. LMW is the only company in Asia outside Europe that manufactures OE products for Mikron of Switzerland. The fact that LMW enjoys a robust 60% market share in the domestic textile spinning machinery industry only adds to validate the company's success. The LMW - Advanced Technology Centre (ATC) is a one-stop solution to all the outer-body component needs of the company's Aerospace customers. The ATC boasts of ultra-modern infrastructure and cutting-edge capabilities that enable the company to provide world-class facilities and services, including Quality Assurance standards that align to AS9100 D certification and NADCAP for special processes. Over the years, LMW has expanded its global presence and has acquired customers not only in developing countries, but also in technologically advanced countries.

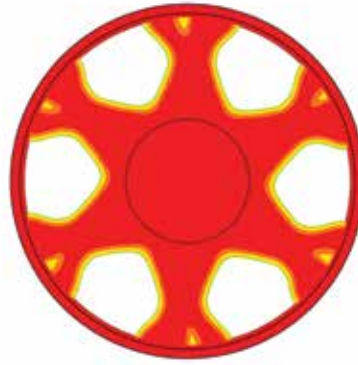


Altair Simulation help us reduce physical prototyping, leading to shorter development cycle time. It helps us succeed in our functional and optimization goals, both in terms of design and cost. One of the major advantages with Altair is the unique licensing method. Their units based system gives us flexibility to use many packages from a wide array of applications. This helps us to reduce investment in multiple software and get better ROI for the investment made in Altair solutions.

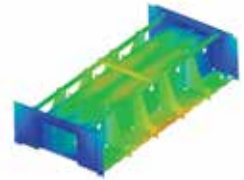
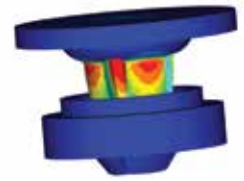
RAJASEKARAN. S
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Optimization - 1



Optimization - 2



Their Challenge

Being a major player and a brand in the textile machinery industry, LMW always focused not only on the structural integrity of the machines, but also on the overall quality of end products. The LMW CAE team has the responsibility of handling the Structural, MBD, and CFD simulations for all their projects. In the absence of an advanced and reliable tool that could help them, the CAE team always faced hurdles in the form of complex meshing interface, erratic modeling of plastics, inability to use various material models, and contact modeling, particularly for nonlinear analysis. These complex tasks took a lot of the team's time and posed tough challenges. There was need to achieve weight optimization of internal components, carry out accurate meshing of complex components, and perform vibration analysis for various parts of the machine. All these pressing issues made the team look out for a flexible and reliable simulation tool that would help them accomplish their design optimization objectives and overall improve end-product quality.

Our Solution

The LMW team set about evaluating various simulation products and their functionality in terms of weight optimization, meshing capabilities, vibration analysis, and non-linear structural analysis. They concluded on Altair HyperWorks™ to be the best suited product that offered comprehensive solutions to address their every day engineering challenges. The team found HyperWorks to be a flexible tool to generate CAE models and a robust platform for carrying out various kinds of critical analyses. Further with extended training on other physics solvers, they used it widely to find solutions for linear and non-linear simulations under advanced static and dynamic loading, structural optimization, fluid flow and multi-body dynamics simulations.

Leveraging the functionality of Altair Simulation, they successfully developed numerous robust and lightweight designs of textile machinery components and achieved considerable reduction in the machine's vibration.

The LMW team has been using HyperWorks since 2008 and extensively uses Altair HyperMesh™ as a Pre-processor and Altair Radioss™ and Altair OptiStruct™ Non-Linear for solvers.

Results

The LMW team achieved remarkable results in their endeavor of bettering textile machinery components using HyperWorks. They successfully achieved their weight optimization targets (-8.5%) for internal components, carried out accurate meshing of complex assemblies, and reduced vibrations through modal analysis for their machines. The LMW team has been using Altair Simulation since 2008, saving considerable model building time with HyperMesh, using Radioss extensively for highly non-linear contact problems, and achieving light weight designs with topology optimization using OptiStruct. All this helps LMW to achieve desired performance and weight reduction of textile machinery components to satisfy their customer demands.

LEFT: Optimization.
 TOP RIGHT: Non-Linear Analysis.
 MIDDLE RIGHT: Structural Analysis.
 BOTTOM: Vibration Analysis.

Partnered with:

