

Mando uses simulation software for accuracy in auto part designing

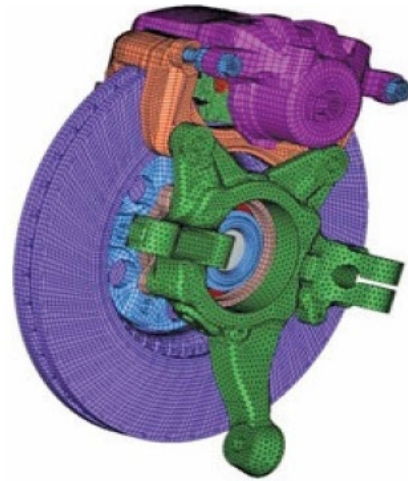
Altair HyperWorks helps Mando Softtech India to conduct in-depth analysis of its product designs and build robust products.

Mando Softtech India Pvt Ltd, incorporated in July 2005, is a wholly-owned subsidiary of Mando Corporation - a leading manufacturer of automotive component systems in South Korea. The company products are brake systems, steering systems, suspension systems and advanced driver assistance systems.

CHALLENGES FACED

Mando Softtech India, being the manufacturer of automotive components such as chassis and brakes, has to ensure that it maintains highest performance and quality standards of the products it develops. Hence, Mando conducts in-depth and heavy analysis of its product designs that will enable them to identify even the smallest of the design errors early in the design cycle, which when addressed, will help them build robust products. Automotive industry being highly competitive and also a price sensitive market, it is a business imperative for the OEMs to compress their design and development cycle time and yet develop products with utmost cost efficiency without compromising on the quality. OEMs in turn pass their pressure to the components suppliers. Hence, Mando India has made great investments into setting-up the right infrastructure in-house with the advanced product design, analysis and simulation tools that will help them achieve their design objectives.

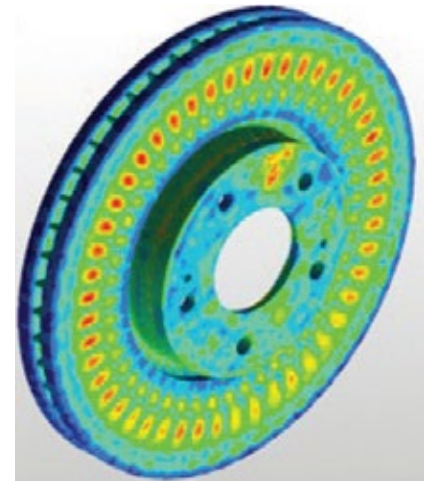
At the R&D centre of Mando Softtech India, some of the complex problems they faced were, conducting accurate Hexameshing. Generating 2D Meshing and 3D Meshing was also a major challenge for them. For long they were looking out for and evaluating software tools that



will give them reliable results with the desired level of accuracy and precision. Another pain area was conducting thermal simulation for ECU casing development. Tetra and Volume tetra meshing is another area it was struggling to find a good tool to work with. Structural and non-linear analysis is also a major part of their CAE activity. Mando needed a tool it could trust to produce accurate results as it would impact their design and decision making, both of which are critical to the company's business success. While they evaluated numerous tools, they wanted to invest in the software solution that will give them the flexibility and liberty to use specific tools for dedicated applications as and when they need, without having to invest in too many different technologies, as that was not turning out to be a cost effective and a viable option for them.

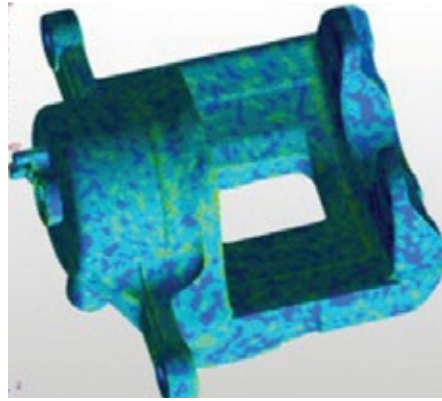
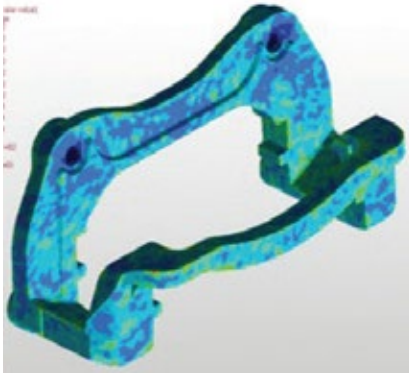
INVESTMENT IN ALTAIR CAE SOLUTIONS

HyperMesh was the first Altair solution that Mando Softtech India invested in and started using in 2008. Later their usage of the tool grew and they even explored the other CAE solutions offerings from Altair HyperWorks. Having conducted



thorough evaluation of the capabilities, potential, and reliability of the results generated by the various software, Mando Softtech India decided to invest more in HyperWorks units and they later added 146 units of HyperWorks. The quality of output, the results and the performance standards of Altair FEA solution helped Mando Softtech India conduct 3D Meshing to their utmost satisfaction. Using Altair solutions it could create geometry and surfaces in the same environment which is quite a rare thing to do otherwise in any other solution.

Mando used AcuSolve for thermal simulation of the development of ECU casing. RADIOSS solver helped them conduct high quality structural and non-linear analysis thus contributing significantly in enabling them to achieve their desired goals of product quality, performance and robustness. Especially in the case of large deformation analysis of steering rack and pinion system, RADIOSS capabilities were of tremendous help to them. With RADIOSS they could investigate product weaknesses, possible failures under the desired level of loads, constraints, forces and boundaries, which when addressed through design correction



led them to building high performance products. OptiStruct solver enabled Mando Softech India to carry out the weight and shape optimisation of a bracket which resulted in them saving considerable amount of material and could obtain an optimized bracket shape with reduced weight and higher performance potential.

Mando Softech India also started making heavy use of Simlab solution for Tetra Meshing, which saved them considerable time and augmented the result quality, which otherwise was time consuming. Over the years, the use of Altair solutions at Mando Softech India evolved from them using only the pre-processing tools, then using solvers such as AcuSolve, RADIOSS and OptiStruct for thermal analysis, structural analysis, and product design optimisation to them working with Simlab for complex and otherwise time consuming Tetra meshing.

Venkat Pechetti, Team Lead at Mando India, exclaimed, “In future we aim to harness greater capabilities of all these CAE solutions and expand our usage of these tools to gain higher benefits. We will work closely with the Altair and DesignTech team to stay updated with the latest features and additions of CAE tools to the HyperWorks product portfolio to understand how we can derive maximum returns on our investment in the Altair solutions.”

WHY ALTAIR SOLUTIONS?

The primary reason for opting to invest in Altair solutions was their long use of HyperMesh that gave them results as per their expectations. This increased their confidence in the potential of Altair software tools. Then they gradually explored the capabilities of other solutions. When they realised that they were looking

at solutions that could effectively address their complex analysis requirements such as Hexa meshing, tetra meshing; product design optimisation, thermal analysis, structural and non-linear analysis, they thought that it would be worthwhile to invest in HyperWorks solutions. A big plus that further eased the decision making of investing in HyperWorks solutions was the HyperWorks units system. They did not have to buy the licenses individually. They would only have to buy cumulative units, which enabled them to decide the utilisation of these units for the licenses or specific solutions depending upon the necessity and urgency of the projects being executed. The flexibility of the use of solutions, user friendly tools and high quality results is what attracted them and in-turn convinced them to opt for Altair solutions.

Venkat Pechetti stated, “Initially, we faced a lot of hurdles, as we were not familiar with the software. We also confronted issues in transferring the data from the different CAE platform to Altair. But Altair and DesignTech support engineers made us very comfortable with the Altair tools. They actually did a lot of hand holding for us and provided us detailed training sessions till our engineers could make the best use of the software and harness their full potential.”

He further added, “We started by using the base product and slowly expanded our usage of the solution while exploring their applications and strengths in the various areas of CAE analysis. Mando is a principal supplier of chassis parts, breaks steering, suspensions and other electronic components to all the leading car makers. We started using Altair solutions for the performance analysis supported


by FEA, NVH and further expanded our use to conducting yield strength analysis of these components. Today we greatly use HyperMesh, RADIOSS, AcuSolve, OptiStruct, Simlab, and sT Inspire to develop products that match the performance standards of all the leading Car manufacturers and OEMs we supply to.”

BENEFITS DERIVED

Implementation of Altair solutions helped Mando India considerably reduce their product development time and costs, while augmenting the product quality. Their overall development time was saved by upto 30-40 per cent. To refer to an example as cited by Venkat Pechetti, the manual process of knuckle joint meshing used to earlier take about 5 hrs, which with Simlab they could complete in between 2 to 3 hours.

They were in search of a dedicated tool for ECU housing drop test simulation that will give them good results within the time constraints. They chose Altair solution for drop test simulation which managed them to complete this project flawlessly and with extremely good results. Their earlier process before using Altair solutions, would take them 3 to 4 days to complete this simulation, but with the help of Altair solution they could finish this task in almost 2 days. Mando Softech India earlier used other solutions also for simulation requirements, but migrated to Altair for higher quality and time advantage.

SUPPORT AND SERVICE

Mando Softech India was extremely happy with the training, support and service provided to them by Altair and DesignTech engineers. Venkat Pechetti stated, “Altair and DesignTech team did not come to make a hard sale. They were more interested in enabling our engineers make the best use of these technologies to help us address all our pain areas, challenges and contribute in helping us achieve our product design and quality objectives.” 

Case Study Courtesy: Altair Engineering India Pvt Ltd and DesignTech Systems Ltd

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