Designing comfortable seats

Harita Seating standardises on Altair Suite of HyperWorks™ for all CAE applications to ensure seating comfort. HyperWorks is a division of Altair.

Harita Seating Systems Ltd, a part of the USD 7 bn dollars TVS group, is a leading manufacturer of seating systems in India, used in the automotive segments of commercial vehicles, tractors, off-road vehicles and buses.

Since its inception in 1988, the manufacturing locations have expanded to six sites in India. The company has various milestones to its credit in all the segments where it operates. All the manufacturing units are certified for ISO/TS 16949, ISO 14001 and OHSAS 18001. Harita has a NABL – ISO/IEC 17025: 2005 certified laboratory.

Harita also has a well equipped Research & Development centre located in Hosur, where it has the following activities:

- Design and development: Concept design and styling, virtual design and engineering CAE/FEA, simulation, trim, textile development, physical testing and validation, tool development with series production, and
- Prototyping and testing: Sheet metal press machine, road condition data acquisition equipment, servo hydraulic rig (single post), hysteresis machine, universal test rig, H point 3D manikin, vibration test system, pressure mapping, 3D measuring machine, lateral stability test, slider endurance test, ingress-egress test.

HyperWorks at work

“In 2014 we were evaluating a variety of CAE tools. After a thorough study of the available tools we decided to procure HyperWorks™. Not only is the software user friendly, the licensing policy is flexible and depth of solutions available within HyperWorks™ is very good. Our concerns on effective usage and establishing correlation between physical test and simulation results were addressed by support from DesignTech and our productivity increased significantly in a very short period of time. All automotive organizations who are looking for weight reduction and performance improvement can definitely try using Altair solutions,” says Allwin Meledath Assistant Manager Research & Development, Harita Seating Systems Ltd.

The company is also using other Altair products like HyperMesh™, HyperGraph™, HyperView™, HyperCrash™ for modelling and visualisation; RADIOSS™ for explicit non linear; HyperForm™ for sheet metal forming simulation; MotionSolve™ for multi body dynamics and optimisation. The main usage is on homologation testing, regulations and crash analysis for all commercial vehicle seats, bus passenger seats and tractor and off-road seats.

On the anvil for future HyperWorks expansion are OptiStruct™ Optimisation and solidThinking Inspire™ for topology, topography, size & shape optimisation.

Sample project metrics

The HyperWorks™ simulation solution helped Harita seating’s in simulating bus, tractor and off-road seats, reducing the total lead time to a greater extent. The design parameters were verified and the analysis is performed before manufacturing with improved quality of the component and tooling. Altair HyperMesh™ enabled a change in process for finite element modelling of a class of bus and tractor seats reducing cycle times by 30%.

RADIOSS™ and OS-FEA is used by incorporating non-linear dynamic explicit solution up-front with saving in the lead time and cost of the repetitive tests. The quality of the seats and parts are improved as the iterative reworking are eliminated are reduced.

Altair Solvers give an insight on arriving at creative non-intuitive designs rapidly and helped in providing new insights about the product performance and also numerous design options. Altair RADIOSS™ solution has become an essential tool in our analysis process, to study the behaviour of our product. Altair unique licensing facility has helped in reducing solving time by 20% using the additional cores without consuming any additional license.

Results & discussions

(Pune-based DesignTech Systems Ltd worked with Altair to install HyperWorks solutions at Harita Seating Systems Ltd)