



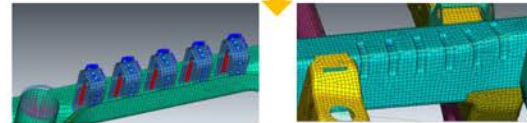
Work Flow – Driven by MeshWorks



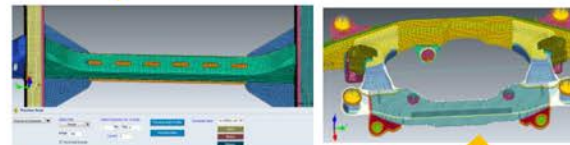
Import CAD and Create Mesh in MeshWorks



Design Enablers like bulk heads and beads from MeshWorks for Chassis Frame to aid what if studies and optimization



Weight reduction feature for the chassis



Seam weld modeling and optimization for chassis frame

Complete Pre & Post Processor

- Comprehensive FE/CFD pre & post processor with powerful tools for CAD clean-up, meshing (shell, tetra, hexa, hybrid etc.), highly automated model assembly and results processing.
- Complex FE/CFD can be generated 30% faster and with better quality than other competitor products.

Customized Engineering Process Automation

- Customer CAE processes can be rapidly automated using a fast Record>Create-GUI>Plumb>Publish process.
- 2X to 10X time reduction can be expected for processes that are repeatable.

CAD & CAE Morphing Technology

- Reduces Finite Element (FE) & Computational Fluid Dynamics (CFD) model building time by 50% to 80%.
- Generated morphed CAD models representing optimized designs very rapidly and form the main link between CAE & Design teams.

Parametric CAE Technology

- Rapidly converts FE & CFD models to intelligent parametric CAE models, enabling fast design iterations & Design of Experiment (DoE) studies.
- Most comprehensive parametrization engine addressing several categories of parameters such as shape, gage, material, spot welds, seam welds, adhesives, design features, etc.

Multi-Disciplinary Optimization (MDO)

- Enables Multi-Disciplinary Optimization to meet design targets, minimize product weight, and minimize manufacturing cost using parametric CAE models.



- MeshWorks as rapid model building and assembly tool for chassis frame and sub frame systems.
- MeshWorks Parametric FE Modeling engine as a great value add for What if scenarios.
- Design Enablers and Weld parameterization for 3G+ optimization driven by MeshWorks.

Challenge faced to study what if scenarios quickly

- Mesh modeling, connections and solver deck generation are standard work flow and MeshWorks does that as well for chassis frames, suspension sub frames. The challenge faced by CAE engineers is to quickly make design iterations to improve performance without waiting for CAD. What if scenario studies might need tools and options beyond mere shape change.

Solution

- With MeshWorks the differentiation comes from CAE model parameterization that includes shape change, gage, material, weight reduction holes, doublers, beads and welds. This wide parameterization option helps engineers carry our what if scenario studies quickly without waiting for CAD thus accelerating the design cycle.
- MeshWorks's extensive FE parameterization options paired with DoE, accelerates design exploration. During stages closer to SOP when all design variables are frozen and only welds remain even then MeshWorks comes in hands to optimize the seam weld length without any performance degradation. With Design space builder and ConceptWorks learning's from topology optimization could be quickly implemented as valid structural members with joints in MeshWorks without waiting for CAD.

Value

- Parametric FE modeling helps users study what if scenarios without waiting for CAD. Design performance enablers like bulk heads, weight reduction holes, doublers TWB, beads and seam welds are created as parameters. Paired with DoE parametric FE model beyond shape parameters accelerate design exploration **without waiting for CAD** and has positive impact in accelerating product development. Savings to user from this transformative process is in excess of 30 percent of product development time.