

Detroit Engineered products (DEP), is an engineering services, product development, software development, consulting and talent acquisition company. Since its inception in 1998 in Troy, USA, DEP is now a global company with footprints in Europe, China, Korea, Japan, and India. DEP uses the accelerated and transformed product development process, accomplished by utilizing our proprietary platform, DEP MeshWorks, which rapidly reduces the development time of products for all segments. The MeshWorks platform delivers tool sets that accelerate virtual validation activities associated with DEP's one of a kind automated modeling solution, "ConceptWorks", engineers can now generate concept members and joints with minimal inputs.

This modeling system incorporates a computer based system that automatically creates elements based on user inputs such as to get a better outcome by simplifying the process. Our automated modeling tool reduces the complexity of procedures by simplifying the processes.

Meshing existing components and parametrizing pieces depending on input from the user via the interface can be made easier with ConceptWorks. It alleviates the difficulty of constructing finite element models without CAD data, which requires a large number of steps and functions to be performed in a specific order.



CONCEPTWORKS

The demand for automation in design segments:

Designers frequently leverage past designs to swiftly generate new designs, in addition to optimizing an existing model. In order to get the required structure, creating the finite element model without the CAD data might take a long time because there are so many stages and functions to be done.

In pursuit of more effective methods:

Design and concept practices might evolve over time as a result of years of industry expertise. The cumulative knowledge of a company's most experienced engineers must be captured and reused. However, most companies struggle to store and share their knowledge with others.

By using technologies such as automation and machine learning, we hope to find better ways to solve these problems. Recently, a number of process models have been developed to plan, evaluate, and regulate the product design & development process.

In the computer-aided engineering (CAE) sector, members, braces, and joints are conceptually modeled. The new challenges brought about by time and sophisticated procedures have prompted the usage of concept modeling.



Application and Key Benefits:

ConceptWorks - Sheet Metal

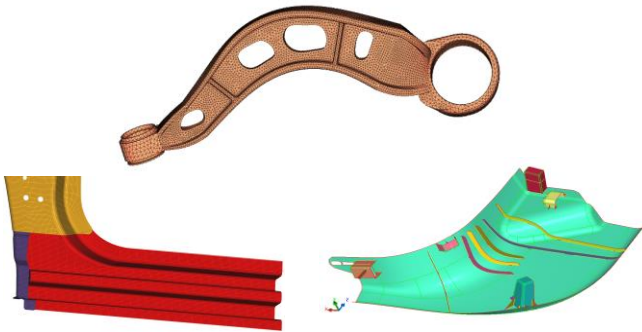
- Using ConceptWorks sheet metal capabilities, early conceptual design and development can be done without CAD data.
- Using specialized parametric tools user can easily build new members, interior components, joints, and unique characteristics like holes, fillets, and beads.
- Using ConceptWorks modules, the conversion procedure for conventional CAE car models into hybrid types are done easily.

ConceptWorks - Plastics

- Using minimal inputs, old design solutions can be easily converted to new designs
- Using Concept Works - Plastics specific features, new model elements can be added to CAD data.

ConceptWorks - Casting

- Using casting, user can rapidly produce a sketch and the topology optimization results will automatically generate a standard section.
- Using Concept Works - Casting specific features, creation of slots and ribs are done easily & at less time.



ADVANTAGES:

BODY STRUCTURES

- New Concepts
- Topology Optimization
- Rapid Designing

FRAME STRUCTURES

- Design Studies
- Automated Functions
- Member Creation

UNDERBODY STRUCTURE

- CAE Modeling
- Design Optimization
- Concept Creation

Features:

Member creation :

Under ConceptWorks, we have a detailed member creation feature which can help users to create both predefined and user-defined members. For both kinds of members, the criteria of height, width, angle, thickness, element size, etc., can be defined based on requirements. Also, member creation can be done as a new feature, using existing members, direction-based, trajectory-based, etc.

Joint creation :

ConceptWorks assists in building suitable joints such as standard joints or special joints based on the given inputs . It automatically creates joints with only a few inputs such as element size, height, cross section nodes, define vector, connecting part, target position, base components.

Adjustments :

ConceptWorks eliminates framework complexity by allowing users to alter existing members and flanges to meet the desired output by simply selecting the element to be adjusted and adjusting the range, deformable nodes, and base components accordingly.

BSO Inner Parts :

In ConceptWorks, the CAE engineers can find more robust functionalities to analyze and build sophisticated inner parts such as Roof Rail Inner, Header, Roof Bow, B-Pillar Inner and so on. With minimal user intervention and fewer inputs that specify location, reference elements, thickness, trajectory etc. one can create the Inner Parts for Automotive Structures.

Special Features :

ConceptWorks, a unique automated modelling tool, will assist users in effortlessly constructing various special features such as fillets, holes, and splits by simply specifying nodes, radius, and elements on the model, with the goal of bridging the gap between model design and analysis.

