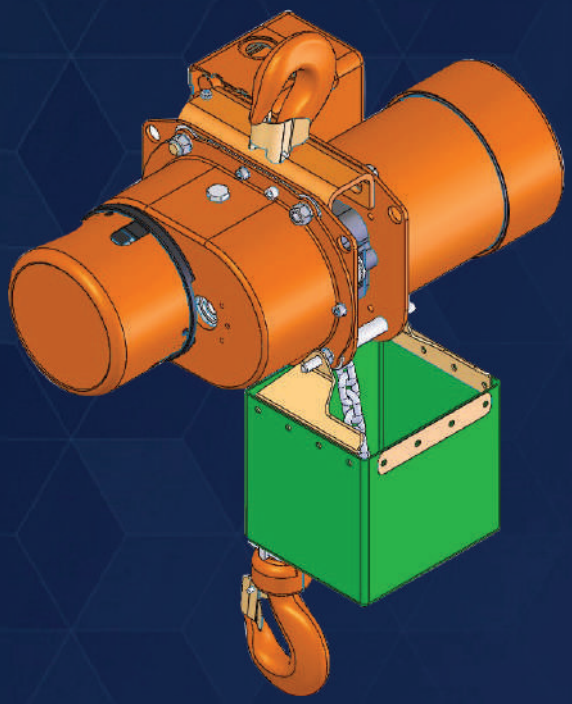
CCE Industrial Equipment



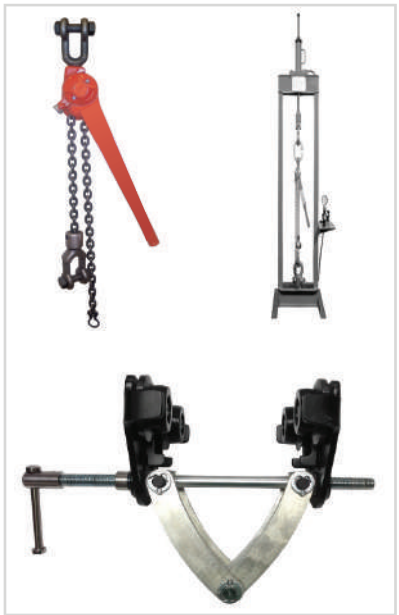
About CCE

CCE is a Michigan corporation in business since 1989. Our offices are located in Farmington Hills, Michigan and Fort Lee, New Jersey, as well as a state-of-the-art engineering development center in Chennai, India. CCE is an engineering product development company that offers a comprehensive solution to our clients, to reduce time, cost, and risk inherent in product development.

We help companies across a wide variety of industries with their new product development (NPD) and sustaining engineering needs.

About Client

The client is a leading worldwide designer, manufacturer, and marketer of material handling systems and services, which efficiently and ergonomically move, lift, position, or secure material.

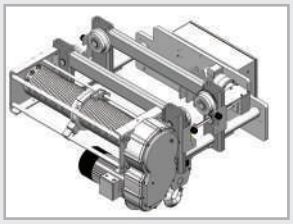


Key products include hoists, actuators, cranes, and lifting and rigging tools and more!

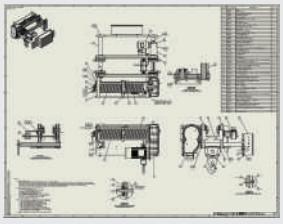
Our Goal

Our goal was to work in collaboration with the client's team on multiple product design activities during the development stage

New Configurations



Final Assembly with New Configuration

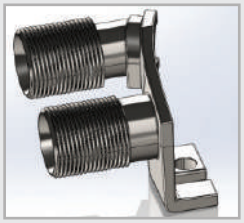


Detailed Drawing

Built new assembly with required configurations as per the given BOM, clearance diagram and reference assembly

New Product Development

- Customers were complaining about a hoist used for entertainment applications regarding water seepage and damage to its internal components
- After conducting different tests, client engineers discovered grommets used in the hoists were causing the problem
- NPD engineers recommended a redesign and replacement of the grommet with a new weather intrusion kit
- CCE's team collaborated with the client engineers and developed a conceptual model for a Dual Grip Base, which solved the problem by eliminating water seepage and damage to its internal hoist components



SolidWorks Model

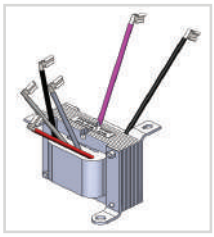
Hoist Assembly

- As part of the project deliverables the CCE team
  - Created parametric SOLIDWORKS model
  - Delivered detailed manufacturing drawing
  - Ensured manufacturability through undercut & draft analysis
  - Considered plus and minus draft dimensions for mold design

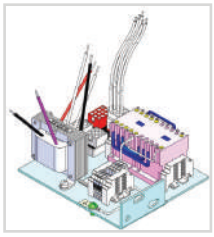
Electrical Component Design

Besides mechanical design, the CCE team also designed electrical components including transformer and contactor board sub-assembly. The deliverables included

- Parametric SOLIDWORKS models
- Detailed drawings with Bill of Materials (BOM)
- Cable and wire harness drawings

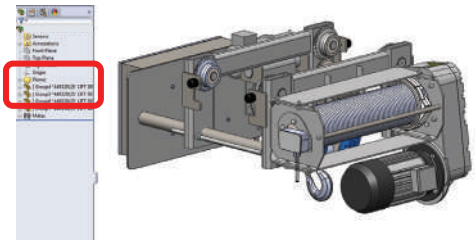


Transformers



Contactor Board Sub-Assembly

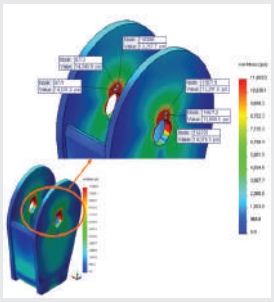
De-featuring



De-featured SolidWorks parametric model by removing all the internal details and created configurations for the de-featured model. De-featured, high level assemblies help in plant layout preparation and to do interference analysis.

Finite Element Analysis

Performed static analysis of Swivel Trunion with the given loads and boundary conditions. Identified high stress zones and redesigned part.



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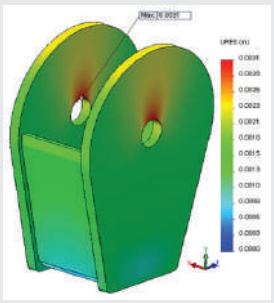

Displacement Plot

- Increased plate thickness
- Added fillet to crosshead
- Extrude cut increased

Work Highlights

- New product development was done in continuous collaboration with the client's team
- All modules were designed using SOLIDWORKS
- The final design, 3D CAD models and manufacturing drawings were delivered to the customer through our proprietary web-based work order management system PowerLink. PowerLink provides control, visibility, traceability, accountability, and helps to improve productivity