

Industrial machinery and heavy equipment

Hydrauvision

Hydraulic power manufacturer uses Solid Edge and Femap to reduce number of prototypes by 80 percent

Products

Solid Edge, Femap

Business challenges

Reduce number of physical prototypes

Provide customers with confidence that hydraulic units will withstand strenuous demands and rugged conditions

Certify that units meet international standards

Keys to success

Use Solid Edge and add-ons such as XpresRoute, sheet metal design and simulation to create more detailed design

Reduce time needed to manufacture hydraulic units

Use Femap to enhance accuracy of simulation results

Results

Reduced number of prototypes by 80 percent

Confirmed reliability and accuracy of virtual results

Provided customers with increased confidence in hydraulic unit performance

Siemens PLM Software solutions enable Hydrauvision to create more detailed designs and enhance simulation accuracy

Providing operational confidence

Hydrauvision specializes in producing hydraulic, pneumatic and mechanical drives and systems for a variety of industries, including industrial machinery and heavy equipment, petrochemical, offshore and dredging, offshore infrastructure, and marine. The company was founded in 1973 and is headquartered in Schoondijke, Netherlands.

Hydrauvision's hydraulic units are used in rugged environments and must withstand a lot of stress, so it is critical that the firm's customers have confidence that Hydrauvision's products will withstand operational and environmental rigors.

"There's a lot of pressure applied to a hydraulic unit and often the tanks are irreplaceable," says Alex van't Westeinde, Hydrauvision's mechanical design engineer. "If the unit's tank can't take it, it will blow up due to applied pressure onto the inner surface of the tank. The tank is often a dominant substructure inside a hydraulic power unit, which can cause a lot of damage to surrounding components or the entire unit when it blows up. This can significantly harm operations as well."



Hydrauvision's hydraulic power units have been used in a variety of high-profile projects, such as the Venice, Italy flood barrier project. The company's tension winches were used to place the huge barriers, each weighing 250 to 350 tons. Its units have also been used by many well-known companies such as Ampelmann, which builds offshore access systems that allow personnel to walk safely from moving vessels to offshore structures such as windmills and oil and gas platforms.

“We’ve found that Solid Edge enables us to do a much more detailed design than was possible in the past. In addition to the core product, we use several add-ons that really help us, including for sheet metal design, piping and simulation. We try to design by including every detail, such as fasteners, to exclude delays in the production process due to design errors.”

Alex van’t Westeinde
Mechanical Design Engineer
Hydrauision



Hydraulic power unit designed with Solid Edge.

Reducing build time

To make sure that its hydraulic units can stand up to strong demands, rugged environments and meet international standards, Hydrauision selected Solid Edge® software and Femap™ software, both from Siemens PLM Software.

Hydrauision uses Solid Edge for design as well as simulation.

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“With Solid Edge, it keeps getting easier to get to a higher level of detail and, as a result, it takes less time to build the machines.”

“Femap is an excellent tool for structural analysis. It is a reliable way to validate the product, gain certification and build confidence with the customer that the unit will perform as expected.”

Alex van’t Westeinde
Mechanical Design Engineer
Hydrauision

Building a better container

Typically, Hydrauvision connected multiple hydraulic power units to a 20-foot International Standards Organization (ISO) container frame. However, based on future projects, the firm determined that it needed more power in a standard size 20-foot container.

The structural and certification demands for this unit were quite high, including a Det Norske Veritas (DNV) offshore lifting appliance, integrated heavy pad eyes, load tests and certified materials. According to the convention for safe containers (CSC) rules, the cases had to be stackable up to 10 containers. There also needed to be a primary structure with no side sections or roof panels. The problem was that it didn't meet certification standards when the side sections and roof panels were cut out, because it was too weak and needed more stiffness.

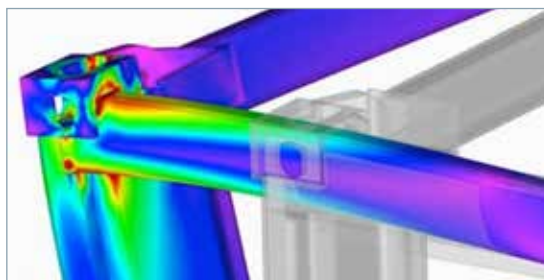
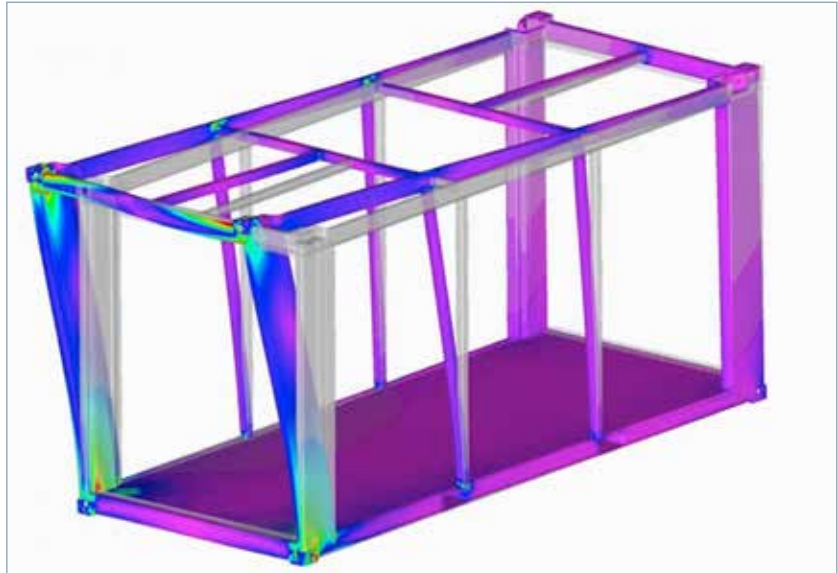
As a result, Hydrauvision decided to address the problem by using Solid Edge to design and assess a new container. In addition to using the core Solid Edge product, Hydrauvision utilized the piping, sheet metal design and simulation applications of Solid Edge.

The company then performed stress calculations on the primary structure using Femap. Using Femap permitted Hydrauvision to precisely determine the maximum gross weight, impact loads and lifting loads. It also enabled it to use CSC certification preparation to determine applicable load cases according to ISO 1496 allowable stresses and permitted deformation for container stacking and bottom lifting.

By using Femap, Hydrauvision was able to simulate all required loading conditions accurately so that only a single physical test was required to achieve CSC certification. In the past, it had been necessary to produce as many as five prototypes, so by using Femap, the firm realized an 80 percent drop in the number of prototypes.

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Alex van't Westeinde
Mechanical Design Engineer
Hydrauvision



Simulation of transverse rigidity of the primary structure created using Femap.

Solutions/Services

Solid Edge

www.siemens.com/solidedge

Femap

www.siemens.com/plm/femap

Customer's primary business

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www.hydrauvision.com

Customer location

Schoondijke

Netherlands



Detailed engineering performed using Solid Edge.

Passing the test

Clearly, Femap has played a significant role in enabling Hydrauvision to fully understand the issues of stress and loading in the structure. In fact, in a test at Lloyd's Register on an offshore container, the deformation predicted by the Femap finite element (FE) model came to within one-tenth of a millimeter of the physical test, which helped expedite the offshore container approval certification.

"Femap is an excellent tool for structural analysis," says van't Westeinde. "It is a reliable way to validate the product, gain certification and build confidence with the customer that the unit will perform as expected."

"With Solid Edge, it keeps getting easier to get to a higher level of detail and, as a result, it takes less time to build the machines."

Alex van't Westeinde
Mechanical Design Engineer
Hydrauvision

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