Lincoln Industrial Goes Global With I-DEAS™

SITUATION

Lincoln Industrial, a subsidiary of Pentair Inc. of St. Paul, Minn., was established in 1910 and is a world leader in automated and centralized lubrication systems as well as pumps and pumping stations for thick fluid transfer. Their customers include major companies from virtually every industry: General Motors and Ford, Caterpillar and Komatsu, Anheuser-Busch and Miller Brewing. The company operates manufacturing facilities at its headquarters in St. Louis, Mo., as well as in Walldorf, Germany, the Czech Republic and India, with additional marketing operations in the United Kingdom, Japan and Singapore.

To support its global focus, Lincoln Industrial needed a CAD/CAM/CAE system that would facilitate collaboration among its design centers in the United States, Germany and India, as well as handle the additional design verification and validation requirements for European and QS 9000 certification.

OBJECTIVES

Increase sales into global markets by:

– Establishing design and manufacturing centers overseas.

– Tailoring products to meet international standards such as Europe's CE mark.

– Shrinking development time to compete effectively.

PROCESS VISION

✔ Migrate from 2D CAD (Prime Medusa) to solid modeling to facilitate design verification and validation.

✔ Adopt the PC/Windows NT computers as the platform for the new system.

✔ Maintain access to legacy data.

"Unlike our previous 2D CAD system, I-DEAS™ software facilitates compliance with the new design verification and validation procedures required to sell our products internationally. I-DEAS has become the foundation of our global strategy."

- Paul Conley
Chief Engineer
Lincoln Industrial

ACTIONS

✔ Lincoln Industrial purchased I-DEAS Master Series™ software because it was a high-end, integrated design, manufacturing, and analysis system which ran well under Windows NT. The ability to translate Prime Medusa data into I-DEAS 2D format was another point in its favor.

✔ The company installed I-DEAS Master Modeler™ software and, within two months, was using it to design products. At that time, the use of Medusa was halted. The company quickly expanded its application of the

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software to the use of finite element analysis to optimize designs to an extent that wasn't possible in the past.

✔ Lincoln Industrial now develops all its product designs in 3D using concurrent engineering practices.

✔ The company takes advantage of solid modeling and analysis to improve the accuracy of design verification tasks such as failure modes and effects and risk analyses. Solid models allow the designers to visually verify design intent, to create rapid prototypes, and to use more computer simulation techniques such as finite element analysis.

✔ The company also uses solid modeling to facilitate design validation. By allowing tooling vendors to work from design data, solid modeling decreases the time needed to produce prototypes for testing.

RESULTS

The use of solid models, rather than the previous 2D drawings, has helped reduce the design process by 25%, for a savings of two to three months in overall cycle time. An integrated CAD/CAM/CAE environment has contributed to the time savings in several ways:

✔ In past projects, it had taken 60 days to get a prototype built for testing. In the upgrade of the Centro-Matic single stroke pump, done in I-DEAS software, rapid prototyping was used to get prototypes in one week. Before the prototype was ordered, the designers had gone through four iterations on-screen, so the prototype was very close to the final product. In the past, the company did not always have confidence that the prototypes they tested were good representations of the final product.

✔ On another project, finite element analysis was used to verify stress levels in a hydraulically driven pump. The results allowed designers to detect an area that needed reinforcement. Finding and fixing this problem before prototype testing saved five to six weeks.

✔ As an ISO 9000 (and soon to be QS 9000) company, Lincoln Industrial is frequently audited and must produce documentation verifying designs. Since the installation of I-DEAS, audits have gone better because this information is captured automatically.

✔ The use of 3D modeling facilitates design verification practices such as failure modes, and effect and risk analyses which help the company meet the requirements of the European CE mark.

PLANS

Lincoln Industrial plans to bring in-house some of the services it currently contracts out, such as thermal, shock, and vibration analysis. These functions will be performed directly with I-DEAS solid model geometry. This will save the company between $750 and $3,000 for each analysis.

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