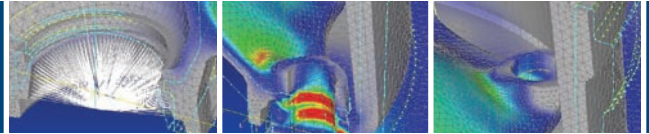


Expanded use of FEA helps company thrive in wheel components market

Femap with NX Nastran's ease of use permits more analyses and more complex analyses – improving the ability to create aggressively priced, highly durable products

KIC HOLDINGS, INC.



www.ugs.com/femap

Business challenges

Continue to flourish in competitive market by offering reduced-weight, lower-cost products

Design products to last one-half million miles and meet lifetime warranty

Keys to success

Replaced MSC.Nastran for Windows with Femap® and NX™ Nastran software

Used VAR support to get up to speed quickly

Full control over analysis models permits more complex analyses

Confidence that UGS will continue to add functionality to Femap with NX Nastran

Results

Femap's ease of use encourages expanded application of FEA

FEA serves as virtual proving ground at lower cost than physical testing

"Analyze twice/test once" practice gets product to market faster and a lower cost

Fast-growing, global operation

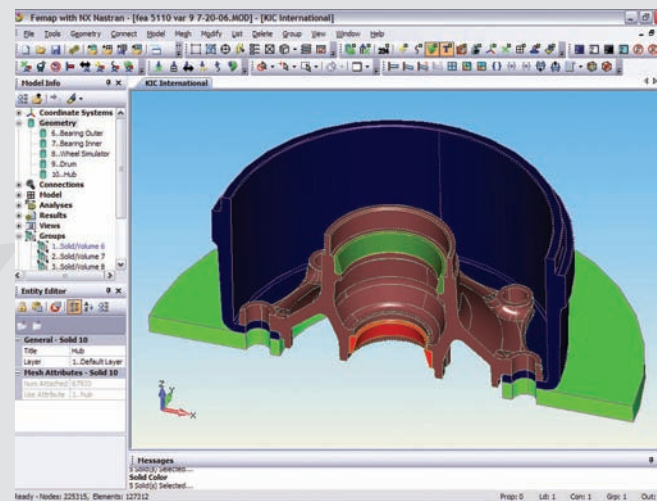
KIC combines North American technology, design and distribution with Chinese foundry and manufacturing expertise to grow at an impressive rate. It has averaged 50 percent growth per year for the past four years. The company provides a "just in time" supply of wheel end products such as hubs and brake drum assemblies. Its customers are trailer, axle and suspension manufacturers such as Hendrickson, Dana Corp., Hyundai Translead, Cheetah and Lufkin Trailers among many others.

KIC's product development team has long relied on CAE technology to meet design challenges. Because a big part of the company's successful growth strategy has been its aggressive pricing strategy, product developers must balance the demands of making products as light as possible while also delivering exceptional strength and durability. "Commercial over-the-highway tractors and trailers generally have a million mile life target," explains Joe Brotherton, director of product development at KIC. "Our wheel hubs are expected to last the life of the truck. Brake drums, although they are a service item, must meet federal performance standards and the durability expectations of our customers, typically 300,000 to 500,000 miles for over-the-highway trucks."

For years, designers at KIC have been using finite element analysis to help accomplish this. With previous experience using Pro/Mechanica, the company later migrated to MSC.Nastran for Windows. But when a local VAR demonstrated the advantages of Femap with NX Nastran, the company decided to upgrade to this solution. According to Brotherton, this was a good decision for a variety of reasons.

Good support shrinks start-up time

One of the first advantages KIC noticed with Femap with NX Nastran was how easy it was to get started using it. This was due in part to the software itself and in part to the support from the local UGS VAR, Predictive Engineering (Corvallis, OR). In contrast to MSC.Nastran, installing Femap with NX Nastran was a walk in the park. "MSC.Nastran was hard to set up," he explains. "It took a week trading emails with MSC to do. We had to do things like modify initialization files



“Femap with NX Nastran has this is a group of motivated software engineers working to constantly add functionality.”

Joe Brotherton
Director, Product Development
KIC

to address setup issues as well as to account for licensing. There was none of that with Femap with NX Nastran. The software was quickly loaded and ready to use.”

Predictive Engineering helped with the transition by demonstrating certain modeling in Femap with NX Nastran. “Having a resource like this got us up to speed faster than buying software in a box,” Brotherton adds. “The ability to have a local reseller that is so eminently knowledgeable was definitely a selling point for Femap with NX Nastran.” Brotherton also appreciates the information available from UGS on the Femap with NX Nastran website. “It has suggestions and you can get feedback so it has been a good resource for us,” he adds.

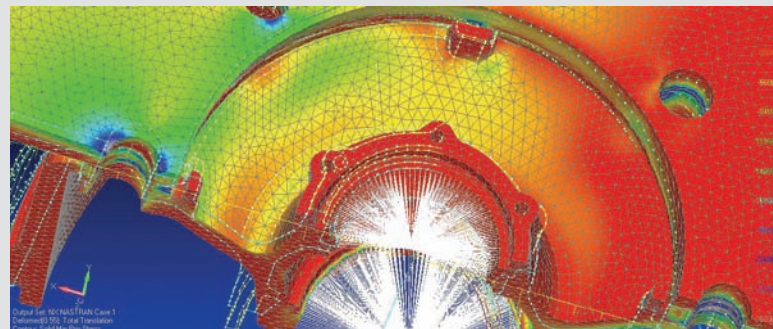
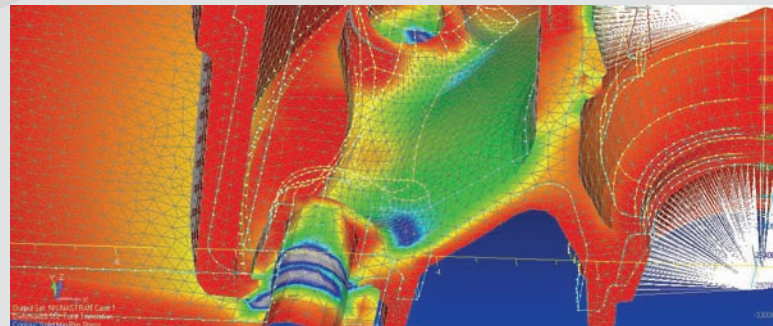
Ease of use invites use

Femap with NX Nastran is used at KIC to provide a virtual proving ground for testing parts. In the real world, physical testing is expensive and slow. “For the cost of two individual brake drum tests, I can buy Femap with NX Nastran and do countless computer studies,” Brotherton says. “These studies give insight into the behavior of the parts that we produce. This allows us to meet our customers’ expectations for lighter weight products, cost reductions (lighter is cheaper) and improved performance. Our customers are engineers, and they look to finite element analysis as part of the design verification.”

One of the main differences between MSC.Nastran and Femap with NX Nastran, in KIC’s experience, has been the level of user-friendliness. “While MSC.Nastran ran on the Windows platform, it did not really take advantage of Windows functionality,” Brotherton says. “For example, you could only have one window open at a time, and it was difficult to navigate through the program. Femap with NX Nastran conforms to all the Windows conventions, so right from the start it’s more accessible. Because information is so readily available, and I was able to navigate through the program so intuitively, I learned it much faster than I learned MSC.Nastran.” What Brotherton has found is that the user-friendliness of the new software invites its further use. “It’s the small things that make Femap with NX Nastran more user-friendly, and the ease of working with it makes you want to do more analysis,” he notes.

More and better analyses

Since the upgrade to Femap with NX Nastran KIC has done some analyses that it never attempted with the previous software. For example, Brotherton recently performed a non-linear contact analysis involving bearing cones in a wheel drum. “When I tried to do a similar analysis with MSC.Nastran, I had to simplify it considerably,” Brotherton explains. “With Femap, I was able to create a more complex model that ran quickly



Solutions/Services

Femap with NX Nastran
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Client's primary business

KIC provides hub and brake drum assemblies to trailer, axle and suspension manufacturers.
www.kic-group.com

Client location

Vancouver, Washington
 United States

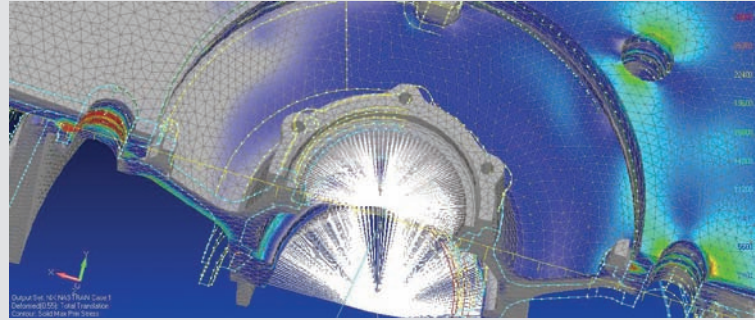
“For the cost of two individual brake drum tests, I can buy Femap with NX Nastran and do countless computer studies.”

Joe Brotherton
 Director, Product Development
 KIC

and got good results.” The end result of the ability to create more complex models is a better ability to predict product performance and optimize weight.

Although Femap with NX Nastran is easier than other preprocessors to use, its functionality is capable of handling even the most demanding analysis

problems. One important capability that Femap with NX Nastran provides is the ability to combine element types within a finite-element model. Some of KIC's analysis models may contain imported solid models (usually in .sat format and then automatically meshed) as well as beam elements and plate elements (to represent a wheel, for example). “Now that we can combine all these elements, we can more accurately simulate mechanical systems,” Brotherton adds. Another distinct advantage of Femap with NX Nastran is “full control of the analysis models,” such the ability to remove layers or volumes to vary the analysis. Brotherton compares what Femap with NX Nastran delivers to the old MSC.Nastran by saying, “MSC.Nastran is like a photo viewer and Femap with NX Nastran is like Photoshop. There's a lot more you can do with your models.”

**The FEA payoff**

In the carpentry world, there is an adage, “Measure twice, cut once.” “In the mechanical engineering world, we use Femap with NX Nastran to calculate twice so we only test once,” Brotherton says. “This pays off in time to market, lower costs and safer products on the roads. In today's global market, we're as likely to see our wheel components in the Outback of Australia as we are on an 'out n' back' to the neighborhood grocery store. We must design our products with care and Femap with NX Nastran plays a big role in helping us do that.”

By upgrading to Femap with NX Nastran, KIC got an FEA solution that is both easier to use and more powerful than its previous system. That, combined with excellent support from a local VAR and UGS, is proving to be a winning combination. And a solution that positions the company well for the future. “One of the reasons we considered replacing MSC.Nastran was that it had become stagnant,” Brotherton says. “UGS has a group of motivated software engineers working constantly to add more functionality to Femap with NX Nastran. With software that is this important to your company's mission, it is better to be moving forward than standing still.”

► **Contact Femap**

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