THIRD WAVE SYSTEMS

MODELING TECHNOLOGY · MACHINING SOLUTIONS

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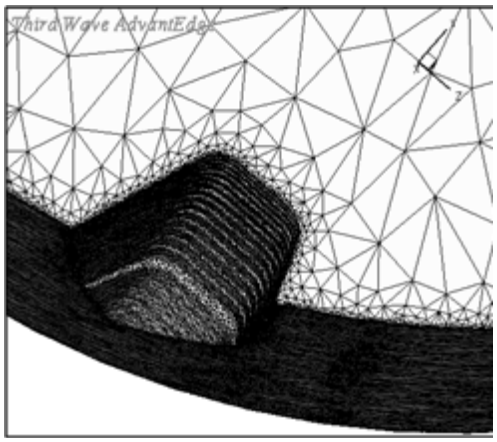
Third Wave to Tackle Gear Hobbing Predictive Modeling

NAVAIR Phase II SBIR Award to Provide R&D Funding

MINNEAPOLIS, MN. (27 March 2012) – Third Wave Systems is excited to announce that it has commenced a multi-faceted research program focused on streamlining and dramatically improving the gear hobbing machining process. At the completion of the two-year effort, gear designers will be empowered to predict, manage, and improve residual stresses in gears, minimizing distortion and improving fatigue life. The program will give equal attention to shortening the development of new and innovative gear hobs, enabling hob manufacturers to design and produce more effective tooling that lasts longer and cuts better by using physics-based modeling for prototype testing. These research activities are supported by a two-year U.S. Naval Air Systems Small Business Innovation Research (SBIR) Phase II award totaling $750,000.



Preliminary AdvantEdge FEM model predicting material behavior during an intermediate stage of gear hobbing. Third Wave will further the development of this modeling capability over the next two years.

"This project presents a fantastic opportunity for Third Wave not only because it enables us to develop new modeling capabilities as they relate to distortion prediction, but also because the resulting technology will be invaluable to many of our customers," said Kerry Marusich, Third Wave President.

Current practices for gear design and development, as well as the introduction of new gear materials, rely heavily on empirical techniques and tribal knowledge. The complex cutting process of gear hobbing makes it highly difficult to model using computer-aided engineering (CAE) products; yet over the past year, Third Wave accurately represented the complicated metallurgical response and limited kinematics of gear hobbing using finite element methodologies. U.S. Department of Defense programs such as the V-22 Osprey will directly benefit from technologies developed within program initiatives, which aim to eliminate gear manufacturing guesswork and make it possible to produce higher

(more)

quality gears in a faster and more affordable manner. Commercial customers in TWS' automotive vertical will also benefit from R&D technology outcomes.

The gear hobbing predictive modeling program is the tenth Phase II SBIR program that Third Wave Systems has been awarded since its inception. For the next two years, engineers will work to develop and demonstrate a general, validated, physics-based modeling capability for the gear hobbing process that will result in detailed chip formation and residual stress prediction in machined components. Ultimately, the resulting technology will promote an efficient, physics-based understanding of the gear machining process and influence the immediate and long-term effects of gear hobbing on product performance.

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(a) This material is based upon work supported by the United States Naval Air Systems Command under Contract No. N68335-12-C-0091.

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About Third Wave Systems, Inc.

Third Wave Systems is the premier computer-aided engineering (CAE) provider for companies that machine. Its modeling products and services are used by progressive companies to dramatically reduce costs of machined components, accelerate design cycles, improve part quality, and get to market faster. This validated material modeling technology gives engineers access to more information than trial-and-error tests, allowing them to make better decisions. Third Wave is headquartered in Minneapolis, USA with a remote office in Detroit (USA), representation in California (USA), and distributors throughout Europe and Asia.

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