



CASE STUDY /

## Ansys + QuEST Global

“By using Ansys simulation software, QuEST Global was able to evaluate many design changes to develop a new frame for a tire balancing machine — more quickly and efficiently than could have been accomplished with standard build-and-test methods. The company was able to meet Hennessey Industries' objective of a 50% reduction in time to develop an acceptable balancer chassis. In parallel, this has given us the option to test various cost reduction opportunities without prototyping which will be advantageous in the future.”

**Matt Weis**

Director of engineering / Hennessey Industries

Hennessy Industries is an international after-market wheel service manufacturer and part of Danaher Corporation, a Fortune 500 company. On a recent project, Hennessy Industries partnered with QuEST Global, a company that provides the entire spectrum of engineering solutions, to develop a new tire balancing machine.

## Simulation Leads to Developing Faster Tire Balancing Machines

### / Technology Used

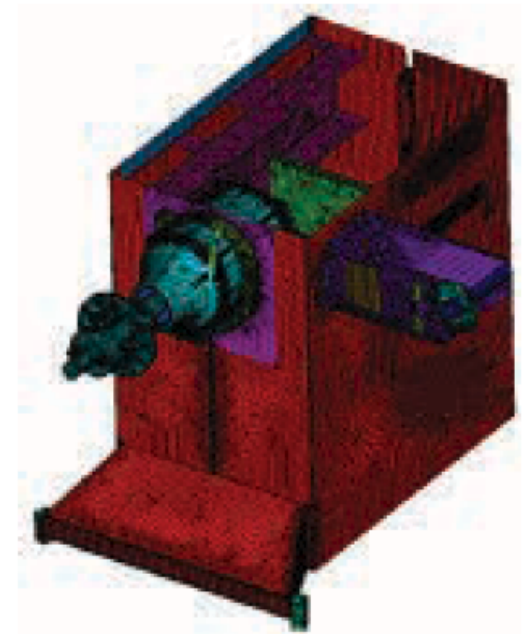
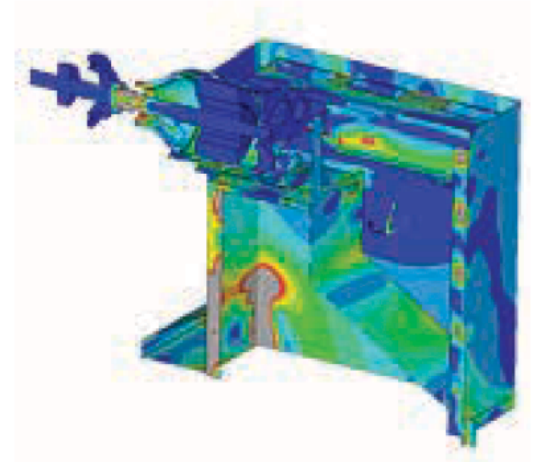
Ansys® Mechanical™

### / Challenges

QuEST Global agreed to help Hennessy Industries to design a frame for a tire-balancing machine that would balance automobile wheels in a shorter time. To do this, the R&D team needed to attenuate the noise generated by the frame during the start of the balance cycle so that the machine's sensors could determine whether any imbalance existed. The new design was required to be approximately the same size, shape and weight as the old machine.

### / Engineering Solution

- Using the advanced structural capabilities of Ansys Mechanical, QuEST Global developed an accurate and computationally efficient model of the existing tire-balancing machine.
- Fidelity of the computational model was validated using accelerometer ping test data from the physical model.
- Harmonic analysis was performed to correlate piezoelectric data with the imbalance of the tire.
- By performing both harmonic and transient dynamic analyses of the entire balancing cycle, QuEST Global gained insight into the balancing process and correlated the results with the original physical model.
- The team analyzed various design changes, such as a thicker frame structure and use of damping pads, to reduce the balancing time.



## / Benefits

- The results obtained using Ansys software matched very well with the test data, giving Hennessy Industries confidence in the use of Ansys structural mechanics software for design improvement.
- The software provided a quick method to evaluate design changes and led to a significant reduction in design cycle time when compared to traditional build-and-test methods.
- The simulations enabled QuEST Global to assess design trade-offs including cost, design constraints, simple modifications and balancing time.
- The cycle time required for the tire balancing process was reduced by 20%.

## / Company Description

QuEST Global is a leading provider of outsourced engineering solutions. The organization helps clients to cut product development costs, shorten lead times, extend capacity and maximize engineering resources availability.

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