ManufacturingHUB.org

INITIATIVE

Computers with thousands to millions of processors performing calculation-intensive simulations are key to the launch of new products by large manufacturers. Engineers use these simulations to determine what products will be made of, how they will be assembled, and how they will perform. Small - to medium-sized manufacturers (SMMs) need the same computational capabilities employed by large companies, but not in large quantity or as frequently. The traditional business model for computational capabilities is tuned to those with large, every day needs and is a significant barrier to SMM use. Developed through the Network for Computational Nanotechnology, the manufacturingHUB.org helps partner SMMs use commercial solutions and deploys new, easy-to-use simulation Apps on a computing cloud to bring these tools of innovation well within the SMM grasp. It uses Purdue’s HUBzero™ platform to host simple Apps for specific simulation tasks while using the power of sophisticated, general-purpose simulation engines “under the hood.”

IMPACT

Here are the stories of two SMMs working with ManufacturingHUB.org.

Jeco Plastic Products of Plainfield, Indiana needed to finalize the design of a plastic pallet they hoped would replace metal ones in use by a major auto manufacturer. Jeco could not accurately model its designs on its in-house desktop computer and software. So, with Purdue expertise and commercial software made specially available for this demonstration project at Ohio Supercomputer Center, Jeco digitally tested the strength of its designs. Based on those results, a final design was chosen, pallets made, and sent to a testing agency. As predicted, the pallets passed the tests, and Jeco made a new customer and a sale forecast to total nearly $23 million in the coming decade.

Boss Industries of LaPorte, Indiana makes and installs air compressor systems on customer-owned utility vehicles. These systems must fit within open spaces on a vehicle chassis, so reducing component size widens the range of vehicle models that can carry a Boss system. The air/oil separation tank is often the largest component. ManufacturingHUB developed an App to model air and oil flow inside a tank, allowing the Boss engineer to compare the performance of possible smaller designs with measurements from the current tanks. Already smaller, cheaper, good-performing designs have been identified that will lead to new business opportunities for Boss.