Solid Edge with synchronous technology allows for fast revisions to existing designs and very easy use of imported CAD data

Meeting safety regulations and customers’ specifications
Tread Corp. manufactures bulk explosives handling equipment and machinery for mining, quarry and construction industries globally. Tread products include bulk trucks, bins, elevators, control systems, explosive storage, emulsion and mixing plants.

Because Tread trucks and other equipment carry up to 40,000 pounds of explosives, the company must design with care to meet safety requirements for diverse and harsh environments around the world. The company must also design to customer specifications, including truck capacity, pumping and auguring rates, mix ratios and compliance with the local regulations of more than 30 countries.

To meet this diverse set of requirements, Tread needs flexible computer-aided design (CAD) tools. “The engineering challenges boil down to doing the math and meeting certain specifications and pumping rates,” says Jim Truskey, designer and engineering software administrator at Tread. “Every customer has their own set of requirements. This one wants this brand of pumps and this one likes this brand. It’s very challenging having to make a truck basically function the same but with
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Designer and Engineering Software Administrator
Tread Corp.

Tread uses Solid Edge® software from product lifecycle management (PLM) specialist Siemens PLM Software to design all fabricated components, as well as to model purchased third-party equipment to determine form, fit, and function.

Use of synchronous technology accelerates designs from scratch

Tread designers are familiar with older history-only based modelers that use a feature approach to create and edit models. Those require a lot of preplanning to handle unforeseen changes that frequently arise. Conversely, history-free modeling is fast, but feature-less, with limited automated design capability.

The designers see Solid Edge as the best of both types of modeling, with highly automated features and dimensions that facilitate flexibility and near-instant performance. “We started using Solid Edge with synchronous technology shortly after it came out, and it’s made a world of difference for us,” Truskey says.

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The company left it up to the individual designers as to which process (history-based or synchronous) they want to use. “Probably 50 percent of us are 100 percent synchronous. It’s very much a time saver,” Truskey adds. “When doing a new design, typically it takes me about half the time than it did using history-based modeling. I can change the design, pull it around, move faces and try various iterations.”

When modeling a part in place, Truskey explains that, “You don’t have to unravel and go back to step three of a 20-step history tree to get where you need to be. You can just grab a face and move it and see how it looks and if you don’t like it you can move it right back.” Tread designers also move assemblies and individual components around to see how they fit and then make faster changes “on the fly.”

**Faster revisions to existing designs**

Tread designs include hydraulic cylinders and pumps that differ in size, depending on what the customer wants. “You can take the model from one size and grab a couple of faces, move it out a few inches and boom, you’ve got the model for another size; it’s that quick and that simple,” Truskey notes. “That has made a tremendous improvement in efficiency.”

Making those changes using history-based modeling, by editing a complex tree of features, would take longer and require too much planning. “It would be faster to just redesign it,” Truskey says. “With synchronous technology, revising a component is easy and fast.”

**More re-use of CAD data**

“With synchronous we can re-use so much data so much faster,” Truskey says. “I’ve re-used the old drawings and made them into something new rather than starting from scratch, and it’s a tremendous time saver. I’d say it’s probably cut our design time down to 25 percent of what it would be if I started at step one with a sketch and a protrusion or a contour flange.”

Many vendors of outsourced components provide Tread with design data in various formats, including those used by SolidWorks® software and Inventor® software as well as neutral formats. “They’ll send foreign CAD data and we download it and boom, open it up with Solid Edge, save it as a PAR file, put our part number on it, and we’ve got it,” says Truskey.

This front-hose reel quad truck, designed with Solid Edge, can auger explosive product into a large bore hole, or mix and pump product through a hose reel into a small bore hole.
“In some cases, that imported data may need changes though,” he adds. “They might send us a model of a hydraulic cylinder that’s in a retracted position and we need a model of it in its extended position, and synchronous makes that very easy. That cuts time on a part like that down by a factor of 10.”

**Freeing up time**

Tread’s use of synchronous technology benefits the company in two ways. It benefits the company as a whole by allowing it to complete complex designs much faster than it could previously. Truskey saw that right away: “I realized synchronous technology is definitely the future of CAD, that it definitely had such potential for production enhancement that there was no way I couldn’t get behind it and throw myself into it.”

But the technology also offers personal benefits for the users. “It’s always good to have more skills and more than one way of doing things; it’s made me more productive,” Truskey says. “It’s allowed me to pursue other items at work such as the software administration side of our CAD and PLM software, and it’s allowed me time to do multiple duties.”

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