



VoluMill™ Toolpath Engine Helps Bob's Design Engineering, Inc. Stay Competitive with Overseas Manufacturers, Keep Jobs in the U.S

THE BUSINESS

Manufacturing components for the electronics industry

THE CLIENT

Bob's Design Engineering, Inc.
Hillsboro, Oregon
www.bdeinc.com

CAM SYSTEM

Mastercam®

TOOLPATH

VoluMill™ from Celeritive Technologies, Inc.
www.volumill.com

The Business Challenge

Attention to detail and continuous manufacturing process improvements led Bob's Design Engineering, Inc. to a lucrative contract producing components for a *Fortune* 100 electronics company a year and a half ago. Another development enabled the company to keep the contract when it recently came up for rebid, repelling stiff competition from a supplier in Southeast Asia.

The contract is for the manufacture of a high-price sub assembly needed by an American company that normally would have been sourced in Asia. Most of the assembly is machined from various grades of aluminum; some parts are made from stainless steel. The components range in size from parts that can fit into the palm of your hand to a plate that requires a 72-inch milling capability.

A former employee of the customer complicated the rebid process. That person took a position with a competitor supplier in Southeast Asia. This gave the competition inside knowledge of Bob's Design Engineering's production methods and costs.

"We already had a proven track record and benchmark machine, tooling, and labor costs for manufacturing these parts," says Jim O'Leary, Tool Engineer at Bob's Design Engineering. "I had to come up with a way to reduce my costs and still remain profitable to make sure we could compete with Southeast Asia.

"When we started looking at shop productivity factors, we realized that we were under-utilizing our equipment," O'Leary notes. "We had a lot of unutilized machining capacity that was leading to higher unit costs than necessary. We also had excellent holding capability and were using high-quality cutting tools, so we had to look elsewhere to reduce costs while retaining profitability."

After some research, O'Leary discovered VoluMill™, and realized that it could eliminate the weak link in their production process.

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Jim O’Leary, Tool Engineer, BDE

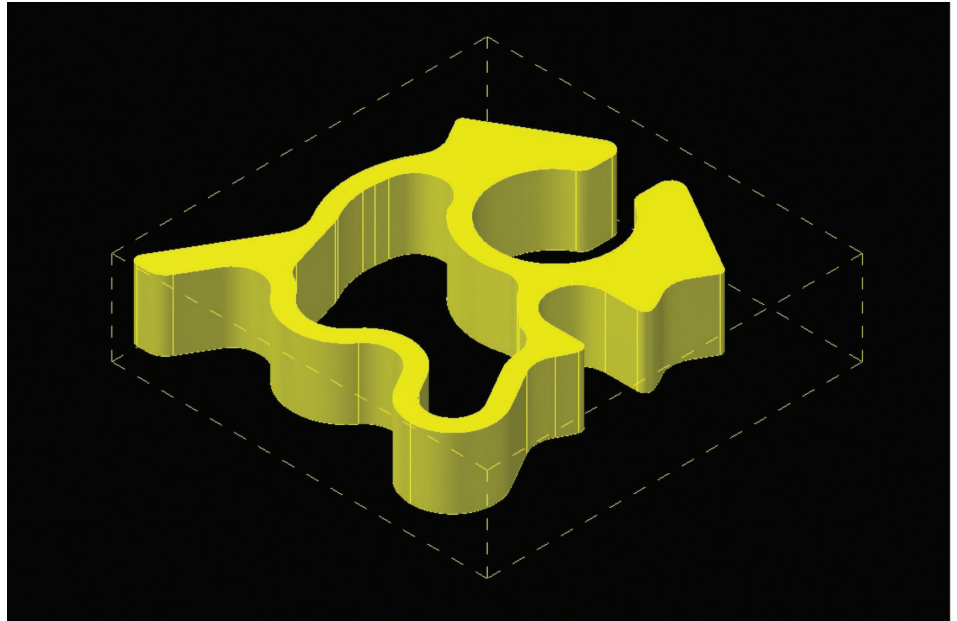
The Business Solution

Created by Celeritive Technologies, Inc. of Cave Creek, Arizona, VoluMill is an ultra-high-performance, plug-in toolpath engine that is used in place of traditional roughing toolpath engines when shop productivity is a priority. The use of VoluMill ultra-high-performance toolpaths has proven to significantly increase machine capacity utilization and reduce per-unit costs on a wide spectrum of part geometries and materials.

“I realized my weak link was toolpaths,” O’Leary says. “We tried a lot of different technologies and services to get a better toolpath, but none of them really worked until we discovered that VoluMill plugged into Mastercam®.”

To test the impact that ultra-high-performance toolpaths might have on his shop productivity, he asked one of his programmers to come up with the most difficult part he could devise. O’Leary invited some tool vendors to participate in the test as well. “We were out to find out what VoluMill could do,” he says.

The part was programmed with the Mastercam High Speed Machining toolpath engine, and with VoluMill. O’Leary says it took his programmer almost an hour to program the test part with Mastercam. “He had to create a lot of extra geometry to reduce material and eliminate a lot of air-cutting time,” O’Leary explains. Having never used VoluMill before, the same programmer read the instructions and programmed the part in 30 minutes,” O’Leary says.



This difficult part took nearly an hour to program with Mastercam®, but only 30 minutes with VoluMill™.

The Bob’s Design Engineering crew then ran the stainless steel part on their oldest machine tool 10 different times using the toolpath created with VoluMill. The average cycle time on the 1 x 4 x 4-inch 304 stainless steel part was less than 13 minutes.

“It took less than 13 minutes at 720 SFM,” O’Leary reports. “The idea of taking a 12-year-old machine tool that’s basically worn out, and cutting stainless steel at that rate and removing that volume of material in that amount of time while getting longer tool life was phenomenal. Everyone in the building was looking at the machining center and saying ‘oh my God, I can’t believe you’re doing this.’”

O’Leary’s group found that it could significantly increase shop productivity by implementing the use of VoluMill ultra-high-performance toolpaths in its

rough milling operation. The company used the data it collected during the evaluation to make adjustments to its cost estimating and bidding. Using VoluMill toolpaths allowed Bob’s Design Engineering to cut costs by 35 percent while retaining profitability, and ultimately to prevail in the Southeast Asia vs. United States supplier competition.

“VoluMill was the reason we were able to cut costs but retain profitability,” O’Leary says. “VoluMill was the final piece of the puzzle. It is reducing cycle times on an average of 50 percent while increasing tool life. It is so easy to program with, it is also decreasing the time our programmers are spending programming a part. What used to take a two hours for geometry creation and trial toolpaths is now reduced to

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Jim O’Leary, Tool Engineer, BDE

40 minutes. We have used it successfully in all materials from aluminum to stainless steel. VoluMill is having a major impact on our production cycles.”

O’Leary also credits the Bob’s Design staff for the success of the company, “We have a highly innovative and competitive group of people here,” he says. “They love the manufacturing arts and worked hard to become world class.”

The VoluMill™ Advantage

O’Leary believes that, in addition to having dedicated and talented workers, innovations like VoluMill are critical to making U.S. manufacturers relevant again on an international basis. “Technology like VoluMill is what’s necessary for American manufacturers to compete globally,” he says.

He’s not alone. David Littmann, senior economist for the Michigan-based

Mackinac Center for Public Policy and one of the nation’s leading economists, agrees.

“It has always been a successful U.S. comparative advantage on the global scene to innovate, to find ways to do things better, faster, cheaper, and more securely,” Littmann says. “Firms that save people time and money and demonstrate responsiveness to customers are securing their own future as well as their shareholders and employees. Relentless effort to improve productivity of the firm – its capital and its workforce – is the closest thing to guaranteed future employment and wealth available to modern man.”

With new contract in hand, Bob’s Design Engineering is continuing to look at ways to make its processes “better, faster, and cheaper.” One way is to use VoluMill for every potential application. “We’re re-evaluating all of our tool paths and using VoluMill on

anything we can apply it to,” O’Leary says.

One automotive part he’s re-programmed involves removing 75 percent of a 1x4x4-inch block of 7075 aluminum to produce an L-shaped bracket. With VoluMill, he’s able to machine the part in 8 minutes, compared to 10 minutes with a conventional tool path. When you consider the parts are made two at a time, the savings can be multiplied by two.

That kind of cycle time savings will continue to make BDE very competitive in the global manufacturing market.

Celeritive Technologies, Inc. was founded to develop and market advanced productivity-improving CAD / CAM technologies. VoluMill™ is a patent-pending ultra high-performance toolpath engine that significantly increases machining productivity and tool life. VoluMill is a full-featured, CAM-neutral, 2- and 3-axis toolpath engine for any geometric configuration. For more information, visit the VoluMill web site at www.volumill.com.

For more information and to take advantage of the 15-day free trial offer, visit the VoluMill™ Web site at www.volumill.com

