



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
computer and printer industry

THE CLIENT

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The Business Challenge

Attention to detail and continuous manufacturing process improvements led Bob's Design Engineering, Inc. (BDE) 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, withstanding stiff competition from a supplier in Southeast Asia.

The contract was for the manufacturing of a high-price sub assembly, needed by an American company known as a global leader in the computer and printer industry. The assembly consists of ball screws, cradles, and drive mechanisms. Most of the assembly is machined from various grades of aluminum, while some parts are made from stainless steel. The components range in size from parts that fit in the palm of your hand to a plate that requires a 72-inch milling capability.

A former employee of BDE complicated the rebid process by taking a position with the competitor supplier in Southeast

Asia. This gave the competition inside knowledge of BDE's production methods and costs.

"We already had a proven track record and benchmark machine, tooling, and labor costs for manufacturing these parts," said Jim O'Leary, tool engineer at BDE. "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 said. "We had a lot of unutilized machining capacity that was leading to higher unit costs than were necessary. We also had excellent holding capability and were using high-quality cutting tools and HSM toolpaths generated by our CAM system, so we had to look elsewhere to reduce costs while retaining profitability."

After some research, O'Leary realized that it was the toolpath that was an obstacle in his production process. Then he discovered the ultra high-performance toolpath engine VoluMill™.

“VoluMill™ was the reason we were able to cut costs but retain profitability. VoluMill was the final piece of the puzzle. It is reducing cycle times an average of 50 percent while increasing tool life.”

Jim O’Leary, Tool Engineer, BDE

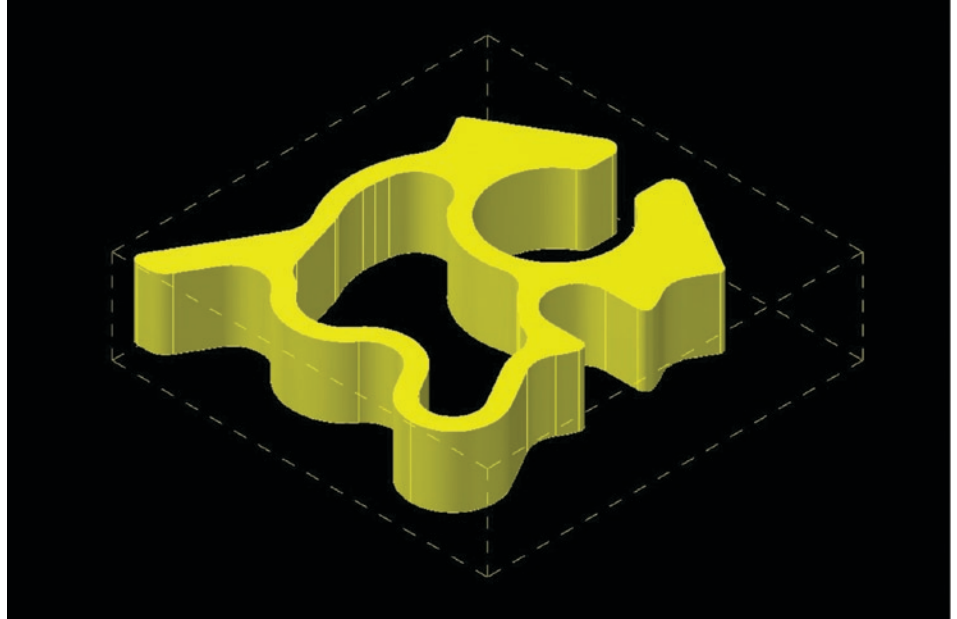
The Business Solution

Created by Celeritive Technologies 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 the toolpath,” O’Leary said. “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 wanted to find out what VoluMill could do,” he said.

The part was programmed with Mastercam’s high-speed machining toolpath engine, and with VoluMill. O’Leary said 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 said. “Having never used VoluMill before, the same programmer read the instructions and programmed the part in 30 minutes.”



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

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

“It took less than 13 minutes at 530 SFM,” O’Leary said. “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 achieving 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 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 BDE to cut costs by 35 percent while retaining profitability and ultimately to prevail in the Southeast Asia vs. U.S. supplier competition.

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

“We’re re-evaluating all of our toolpaths and using VoluMill™ on anything we can apply it to.”

Jim O’Leary, Tool Engineer, BDE

The VoluMill™ Advantage

O’Leary believes that innovations such as 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 said.

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 said. “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, BDE 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 toolpaths and using VoluMill on anything we can apply it to,” O’Leary said.

One automotive part he’s reprogrammed involves removing 75 percent of a 1 x 4 x 4-inch block of 70-75 aluminum into an L-shaped bracket. With VoluMill, he’s able to machine the part in

eight minutes, compared to ten minutes with a conventional toolpath. 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.



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