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Case Study: Software Machine Simulation Software Cuts Lights-Out Machining Time in Half

Software program results in increased accuracy, improved finishes and decreased cycle times.

Mueller Machine & Tool Co., LLC (St. Louis, MO) prides itself on building high-quality, low maintenance molds since the company opened its doors 50-years ago. In order to adhere to strict leadtimes without sacrificing quality or price, Mueller Machine & Tool turned to CGTech/Vericut software (Irvine, CA) to verify cutter paths to the CAD model before they were cut into cavities.

This 95-person shop with 50 CNC machines ranging in size from 12"x12" travel to 72"x120" travel, builds plastic injection molds, prototype molds, structural foam molds and thermoset molds for the appliance, lawn and garden, agricultural, medical, communications and automotive industries.



Operator Chris Wamser setting up the A-plate in the Makino V99L

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Mueller Machine & Tool Co., LLC
5932 Jackson Ave.
St. Louis, MO 63123
(314) 522-8080
Fax: (314) 522-8003
muellermachine.com

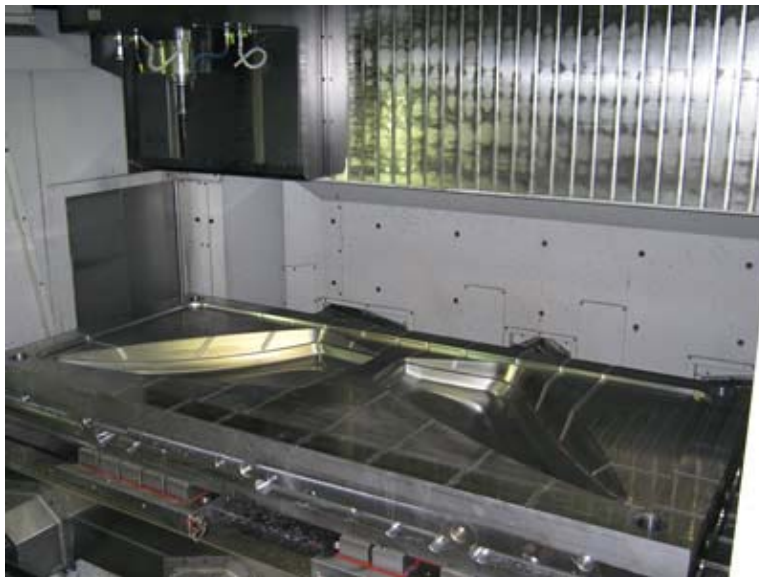
For more information visit [CGTech/Vericut's MMT Online Showroom](#).

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With the push to decrease leadtimes a programming mistake in an expensive cavity block can lead to unacceptable results for Mueller's customers, both in quality of mold and leadtime delays, so they needed a way to verify programs before committing them to expensive cavity blocks. Several solutions were considered, even pre-running programs in Styrofoam before running in the cavity steel. Mueller needed to find a way to eliminate the *pre-running*, so machines could be used to make chips. They chose CGTech/Vericut for its ability to compare NC programs to CAD models.



A-Plate in the machine. A-plate is 72" x 36" x 8"

CNC Machine Simulation

According to CGTech/Vericut Marketing Communications Manager Bryan Jacobs, Vericut software [simulates CNC machining](#) in order to detect errors, potential collisions or areas of inefficiency. "NC programmers can correct errors before the program is ever loaded on the machine, which eliminated manual prove-outs," Jacobs explains. "The software also [optimizes NC program cutting speeds](#) for more efficient machining, even on high speed machines."

Jacobs elaborates that the machine simulation has the ability to detect collisions and near-misses between all machine tool components such as axis slides, heads, turrets, rotary tables, spindles, tool changers, fixtures, work pieces and cutting tools. "The programmer can set up what we call near-miss zones around the components to check for close calls as well as detect over-travel errors," Jacobs comments.

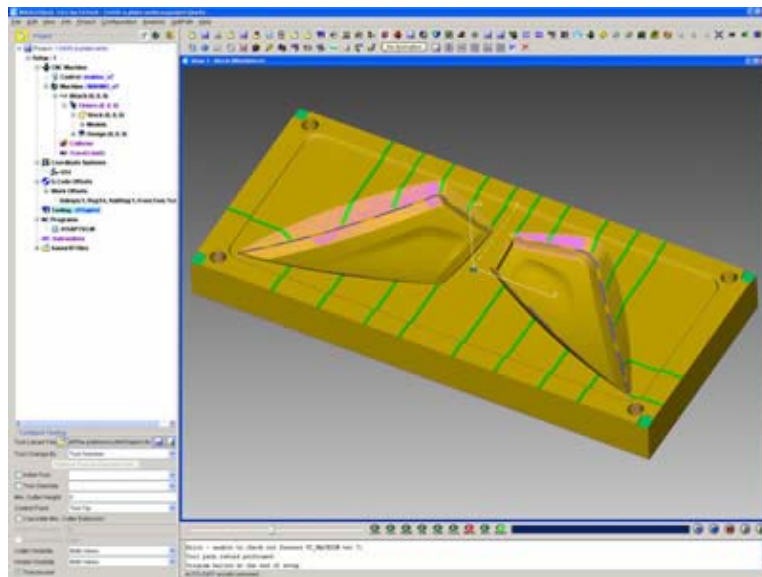


Eric Brandt operating Vericut and Cimatron cam system.

CNC Control Emulation/G-Code Support

The software also accurately emulates CNC control logic. "Each control in your shop can be accurately simulated to account for different types of machines, programs, parts and functions," Jacobs states, "and there is no special programming language needed to simulate most CNC controls."

Jacobs adds that the programmer has the ability to customize controls. "G-code characters and numerals are defined in a logical "word/address" format using pull-down dialog boxes, then configured to call CGTech action macros—which simulate control functions. The control logic also supports conditional checks (other codes in the block, current variable values, machine states, etc.) that can alter how the word/address is interpreted."



Screen shot of Vericut.

Reliable Results

According to Eric Brandt, CNC Programmer of Mueller Machine & Tool, Vericut allows the operators to gouge check and prove out CNC programs before running them on the milling machines. "Vericut has the best tools to prove out programs," Brandt states. "The end results are increased accuracy improve finishes and decreased cycle times. Our lights-out machining time has been improved by 50 percent since the programs are proven before the parts are in the machine."

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