



GibbsCAM 2013 Coming Soon! [Read More Online »](#)

Greetings from Bill by Bill Gibbs, Founder and President, Gibbs & Associates



I hope that 2013 has been a good year for all of you so far. 2012 was a good year for us. Cimatron hit new levels of sales in 2012, both for GibbsCAM and CimatronE products. We would like to say “thank you” to all our customers for that. Being a growing company allows us to invest in things you care about, like software improvements. As I type this, we are putting the finishing touches on GibbsCAM 2013. I think you will find it offers a collection of significant improvements that will make your programming faster and easier. We have new capabilities for automating your programming, some improvements to help cut parts faster, and better support for Swiss machines. I think we have something for everyone.

Have you heard about 3D Printing (3DP) for Production? 3D Printing (aka Additive Machining) is a fascinating technology. You can print metal parts that are otherwise impossible to manufacture. Rather than thinking of 3DP as competing with traditional CNC machining, I think it makes a lot more sense to simply think of 3DP as another type of machine to integrate with milling and turning, in planning the optimal way to manufacture a part. I have written a brief [article](#) on this topic posted on our website. We want to be sure that GibbsCAM can do everything you need to do in order to use 3DP as part of your integrated manufacturing strategies. You will probably be surprised at the level of support we provide today in GibbsCAM 2012+. To make sure we stay ahead of the curve, Cimatron has created a 3D Printing Advisory Board, and is inviting industry leaders to work with us in planning our future developments in this space. [Continued on pg. 2 »](#)

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[GibbsCAM.com »](#)



COMPANY: **Taylor Forge Engineered Systems**

LOCATION: **Paola, Kansas**

WEBSITE: www.tfes.com

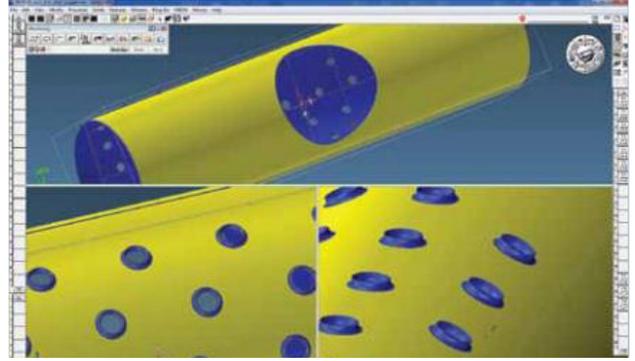
USER SINCE: **December, 2009**

COMPANY DESCRIPTION:

Taylor Forge Engineered Systems is a unique design and manufacturing organization that serves the petroleum, natural gas, and nuclear power industries with three manufacturing facilities, all located in Kansas.

PART DESCRIPTION:

Boring, beveling and finishing the dozens of precisely located holes on this Inconel header for a solar power plant was accomplished on a Haas VF11 4-axis mill. GibbsCAM Feature Recognition and Hole Manager facilitated speedy programming of all hole-making operations, in 20 minutes, and a 4-axis machine was required for single set-up machining, repeatability and holding true position tolerances from three datums over the 8-foot length of the header.



Are you doing some really cool programming with GibbsCAM?

Would you like to show off your stuff in front of other GibbsCAM customers?

If your answer is "Yes!" then forward your VNC files to us, along with pictures and other interesting information about the job. A panel of qualified experts will select winners to be published in the next customer newsletter. Entries that get published will receive a free GibbsCAM baseball hat. But here's the best part: all submissions will be reviewed for potential selection as a case study story that may be published in a national manufacturing trade publication. Interested? Then e-mail Marketing@GibbsCAM.com or call us at (805) 523-0004.

Greetings from Bill CONTINUED FROM PG. 1

In addition to getting GibbsCAM 2013 shipped out, GibbsCAM Development has just reached an important milestone in our development of the UKM (Universal Kinematic Machine) project for GibbsCAM. UKM is our second generation architecture to support the next generation of advanced MTM machines. We continue to invest heavily in MTM technology to ensure our ability to support your current and future needs.

In March we held our International Sales Conference. Over 100 attendees participated in technical and sales presentations. The presentation of new GibbsCAM 2013 features was very popular. The schedule had time for some recreation including our awards banquet. Here we honored our top performing Resellers for 2012. In

first place, again, was Fructus of Sweden. Close behind was Midwest CAM of Minnesota. Productec of Switzerland and Texas Offline completed in the top 4. Not only are they top selling Resellers, but they're also valued for the quality service they provide their customers.

I wish you continued success this year. I believe that tools that we are providing to you in GibbsCAM 2013 will help you program and cut parts faster and easier, and as a result, help you achieve a more profitable 2013.

Regards,

GibbsCAM Introduces Two New Options for Turbomachinery and Port Machining

5-Axis MultiBlade and Porting Options Provide Economical and Specialized Solutions

Two new GibbsCAM options, 5-Axis MultiBlade and 5-Axis Porting, are designed to simplify complex 5-axis NC programming requirements. These new options are designed with specialized interfaces for both vertical markets. Each interface utilizes application terminology and associated parameters which makes creating toolpath fast and simple.

The 5-Axis MultiBlade option provides access to toolpath strategies used in machining bladed parts such as impellers, blisks (bladed disks) and blings (bladed rings). These types of parts are used in multiple industries where fluid (gas or liquid) compression or pressurized flow is required, chiefly aerospace, automotive and power generation. The 5-Axis Porting option provides specialized strategies to machine tubular apertures of all types but mainly associated with engine ports, manifolds and throttle bodies. These options are fully integrated into GibbsCAM and can be used on both 5-axis machining centers and Multi-Task Machining (MTM) machines. Consistent with the rest of the GibbsCAM NC programming environment, the new options are easy to learn and easy to use. They are supported within the GibbsCAM 5-Axis simultaneous and MTM environment, including GibbsCAM Machine Simulation and GibbsCAM 5-Axis and MTM postprocessors.

GibbsCAM MultiBlade Simplifies Machining of Bladed Parts

The desire for efficiency is driving rapid growth of 5-axis machine tool use and the trend toward making turbomachinery parts is expanding beyond familiar components, such as those within jet engines. Both trends provide a great opportunity for manufacturers to adopt GibbsCAM's 5-Axis MultiBlade option. Equally important is an intuitive, easy-to-use interface which uses common turbomachinery terminology. Another simplification is that geometric manipulation is rarely necessary

because MultiBlade works directly from the geometric model. Users need only select predetermined items such as the hub, blade, shroud, etc., to begin programming. Furthermore, toolpath strategies available within MultiBlade are only those required or typically used to machine those geometric elements, but with all the flexibility to specify machining parameters. Turbomachinery parts which previously could not be programmed with GibbsCAM or that proved to be extremely difficult can now be programmed easily, effectively and efficiently.

GibbsCAM 5-Axis MultiBlade is available in two options, Level 1 and Level 2, to allow users to purchase only the technology required for their specific programming needs. The MultiBlade Level 1 option is designed for machining parts of simple to moderate complexity, and provides a subset of the features within the Level 2 option, which adds functionality for machining highly complex parts. User requirements determine which option is best for the individual manufacturer.

General Features of 5-Axis MultiBlade Level 1 & 2 include:

- Roughing between blades with splitter support
- Blade, splitter and hub finishing
- Blade fillet finishing
- Leading- and trailing-edge control and extension
- Tool axis tilt controls
- Automatic axis detection
- Tool axis smoothing
- Splitter smoothing
- Multiple splitter support
- Various options for toolpath rotations and sorting
- Stock definition for rest machining
- Creates 5-axis G-Code that can run any CNC machine

GibbsCAM 5-Axis Simplifies Porting

The GibbsCAM 5-Axis Porting option was primarily developed for manufacturing engine ports, but can also be used on any hollow parts that have significantly different shapes or sizes at each open end or have a significant amount of curvature from one end to the other. The software can automatically detect the spine curve through the port and align the toolpath accordingly. It can also split upper and lower operations automatically based on available tool reach with the proper blend amount between them. Besides easier and faster programming, the resulting toolpath is cleaner and more efficient allowing for faster machining times and better quality parts. Both roughing and finishing strategies keep the toolpath in 3+2 mode until full tilting using 5-axis simultaneous motion is required. All full 5-axis motion is calculated to provide smooth and gouge free toolpaths. Both spiral and plunge finishing are included as well a rough and rest roughing strategies.

General Features of 5-Axis Porting include:

- Roughing and rest roughing strategies
- Spiral and plunge (along) finishing
- Automatic spine detection
- Automatically calculates optimal tilt angles without need to split surfaces or create tool axis control splines
- Cut only top of port, only bottom or both sides in single operation
- Creates 5-axis G-Code that can run any CNC machine

Early Adopters Needed

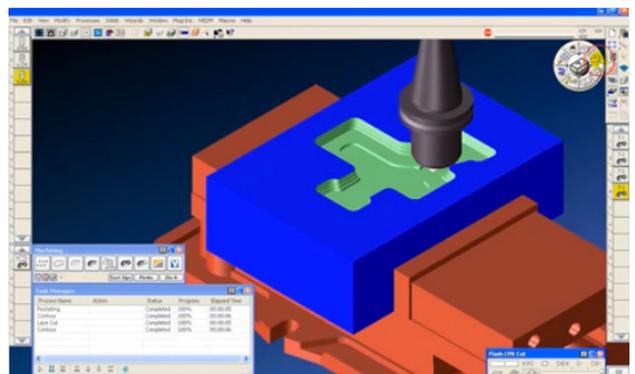
5-Axis-MultiBlade and 5-Axis Porting are powerful new GibbsCAM options for those who need to machine turbomachinery parts or porting parts. Gibbs is in the process of identifying a few early adoption customers for these new options. If you are interested in becoming an early adopter please contact Sales at Sales@GibbsCAM.com or your local GibbsCAM Reseller.

GibbsCAM Video Showcase

Our GibbsCAM Video Library includes an assortment of videos from our customers and partners sharing their GibbsCAM successes.

GibbsCAM – Autodesk

This clip demonstrates the ease of usability between GibbsCAM and Autodesk and demonstrates the interoperability between the two programs. The Autodesk user can design and model parts in Autodesk and transfer directly into GibbsCAM to create toolpaths for CNC machining [Watch Video Online »](#)



Do you have GibbsCAM video footage and/or plan to prepare video footage that you would like GibbsCAM to consider for the new video library? If your answer is "Yes!" then please contact us at Marketing@GibbsCAM.com.

GibbsCAM 2013, v10.5: You Spoke; We Listened

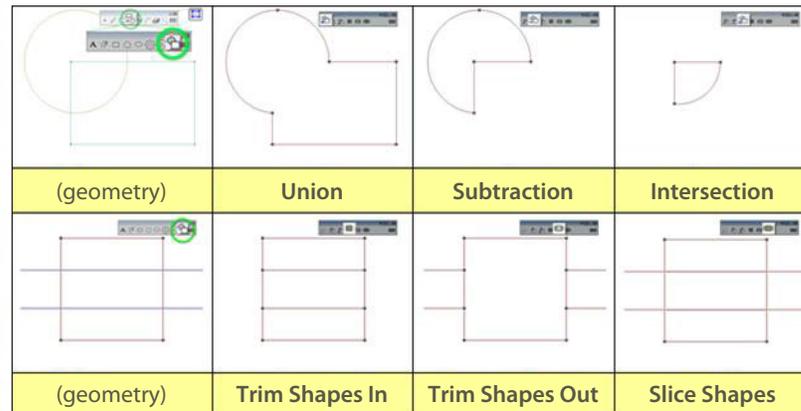
At the March Reseller Conference, assistant product manager Daniel discussed how the gathering of aggregated usage statistics allowed the product management team to learn which dialogs and plug-ins were the most used, and how this led to the incorporation of some popular plug-in functionality (Offset Contour, Z Ramp Contour) directly into the process dialogs.

Then, he went around the room asking which GibbsCAM 2013 enhancement was their favorite. Listed and described below are the top dozen, in order of reply: new Geometry Shape options; Mill Feature; improved Lathe Plunge Rough; new Profiler options; rotary sorting of holes; zoom to cursor; Explode modes; Select Other; improved Surface Flow Cut; toolpath picking/interrogation; and associative Engraving parameters.

For complete details, see [What's New in GibbsCAM 2013](#).

Geometry Shape: Combine / Trim / Slice

The Geometry Shape palette is updated for the first time in several years. The new subpalette lets you manipulate shapes as regions that can be combined, trimmed, or broken into segments.



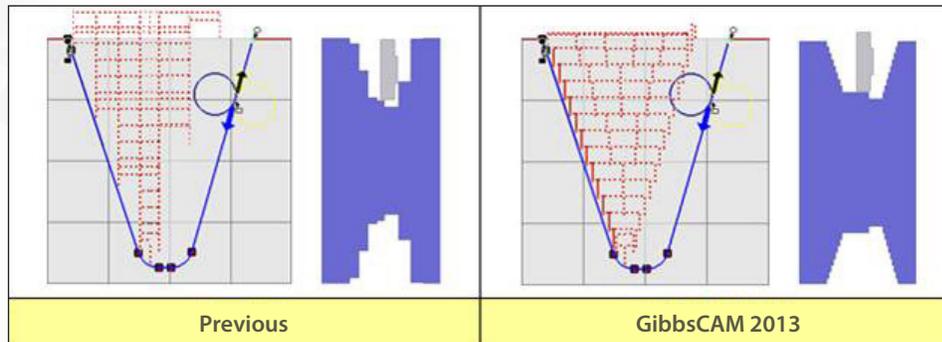
Mill Feature

The addition of Mill Feature functionality is the largest enhancement in GibbsCAM 2013. It leverages the intelligence built into feature-based design by allowing tool moves to be programmed according to user-named attributes, rather than requiring users to supply numeric values for each process parameter. This brings power and simplicity to Knowledge Based Machining (KBM) using saved processes: With just a few mouse clicks, you can quickly and easily accommodate part or process changes or program new parts or families of parts.

Describing all the capabilities of Mill Feature is well beyond the scope of this article. For an easy introduction, look at the sample parts, saved process lists, and corresponding video supplied with the release: **Mill Feature*.vnc**, **Pocket*.prc**, and **Mill Feature.mp4**.

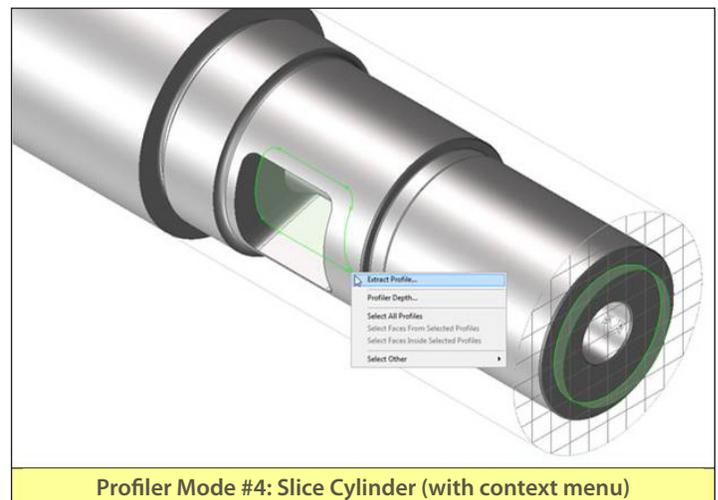
Lathe Plunge Rough

Prior to GibbsCAM 2013, Lathe Plunge Rough generated adequate toolpath that exhibited the relatively unintelligent nature of the algorithm: There would be unnecessary tool movement and very uneven tool load, with frequent air cuts. The contrast with Lathe Plunge Rough toolpath in GibbsCAM 2013 shows how intervention into an algorithm can make the result more elegant and serviceable in every way.

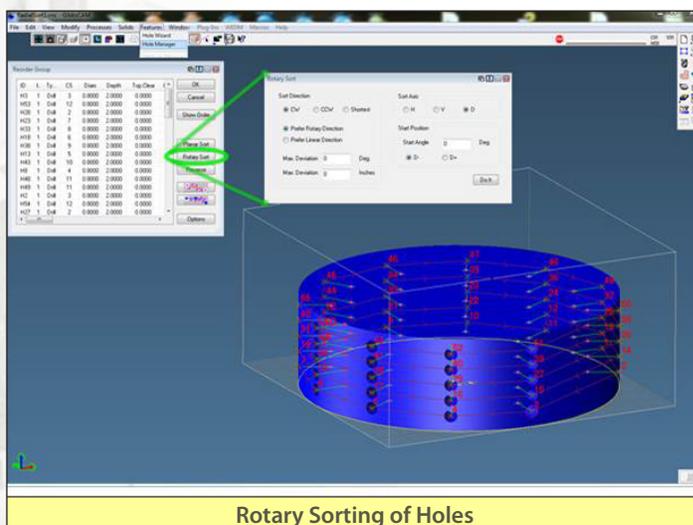


Profiler

The Profiler now offers four modes directly from the main toolbar. To change modes, click and hold the button and choose one of the following Profiler modes from the drop-down list: Slice Plane (the default, and as before), Slice Spun Body (to slice the outline of the result of spinning all elements around the rotary axis); Slice Silhouette (to display the “shadow” cast by all bodies); and Slice Cylinder (to create a slicing cylinder that can be radially expanded or contracted, as shown below).



Profiler Mode #4: Slice Cylinder (with context menu)



Rotary Sorting of Holes

Rotary Hole Sorting

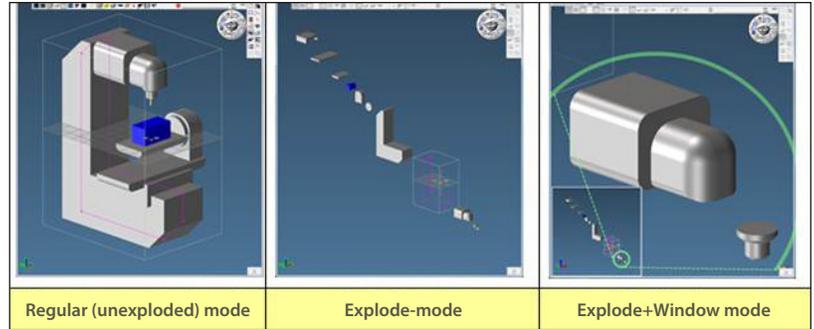
Hole Manager can now sort holes around a rotary axis as well as the usual within-plane sorting. The new dialog box offers a variety of options so that you can generate the sequence best suited for your part.

Zoom to Cursor

For improved consistency with popular CAD systems, a new option in the **File > Preferences > Interface** tab lets you use the mouse cursor as the center of mouse-wheel zooming.

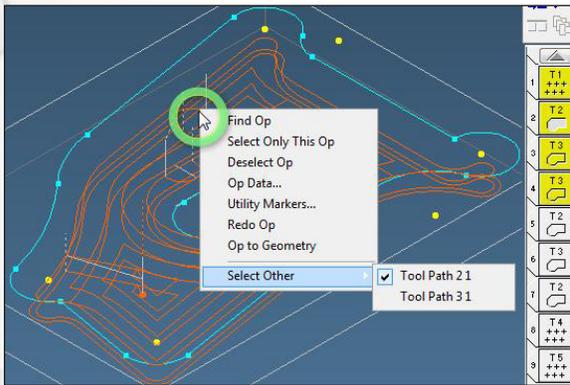
Explode Modes

GibbsCAM 2013 adds two new visual modes: **Explode** (press and hold the **E** key to arrange all elements in the workspace in a diagonal from upper left to lower right); and **Explode+Window** (press the **W** key to display a small viewport window in the lower where workspace elements are arranged in explode mode, with the main workspace zoomed in on whichever element you hover your cursor over).



Select Other

When you need to pick an element on a crowded screen, a new item on the context menu (right mouse menu) lists all candidate elements, so you can select elements even when they are completely obscured



Toolpath Picking / Interrogation

You can now right-click toolpath to find the operation associated with the selected segment; and the right-mouse-menu (RMM) offers several other functions (including “Select Other”, noted above). And, throughout the system, you can now **Alt+click** toolpath to interrogate it into a text box.

Surface Flow Cut

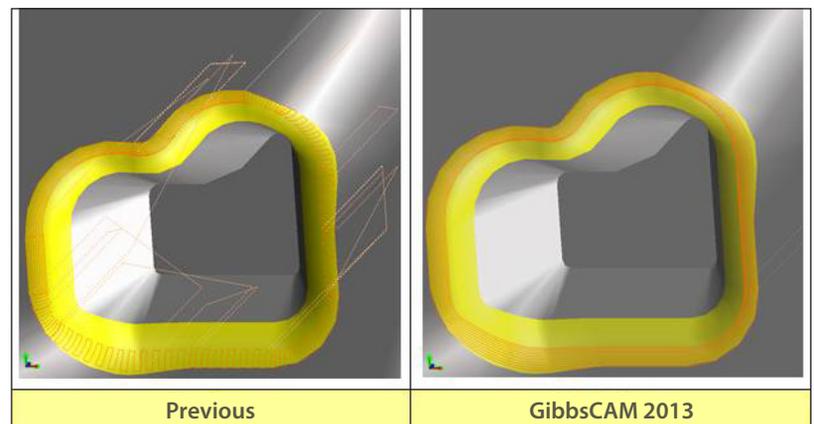
In SolidSurfacer at GibbsCAM 2013, the Surface Flow Cut strategy provides new functionality and a more powerful algorithm that better accommodates more kinds of blended faces.

Associative Engraving Parameters

Now, when you create text geometry, it “remembers” its parameters (align point, font, spacing, etc.), allowing you to edit and redo the element or to reuse text parameters.

Recap

We are glad to offer this variety of enhancements and improvements, drawn partly from our long-term agenda for feature machining but largely from requests we’ve received from you, our customers. We hope it pleases.





It took a supplier 2 1/2 years to deliver the first good part of an order for this end cap, using 15 setups to machine the part. Using a single setup on a Mori Seiki NT programmed with GibbsCAM, Avmat eliminated all the inaccuracies (and scrap) caused by multiple setups and delivered the first part in 3 weeks.

A Soft Landing for Distributor Making Hard Parts

Many machine shops are started by people who love machining or “making stuff.” There are also stories about companies bringing work back in house because of problems with quality or lead time. What is rare is a distributorship starting a machining operation and making it successful, which is precisely what Avmat Aviation Materials Management has done.

Machinist and lead programmer, Kyle Vander Meyden, experienced all of the shop’s challenges first hand. A machinist since 1990, he knew nothing about CNCs until 2003, when first exposed to CNC mills and GibbsCAM. “Fortunately, it was easy to learn and really easy to use,” he says. “But I had to learn G and M codes at the same time.”

When he started at Avmat, in late 2006, he faced a similar challenge. “I knew manual lathes, but nothing about CNCs, so I had to learn those codes, and learn to program the NLs,” he explains. “But the GibbsCAM lathe module was so simple that I figured it out myself.”

For 25 years, Avmat was strictly an aircraft parts distributor, purchasing parts from suppliers to

resell to airlines and overhaul shops. In April 2006, Avmat was purchased by a private investment group that decided the company could better serve its customers and profitability by manufacturing its own parts. Two months later, with licensing from a major aircraft manufacturer and FAA PMA (Parts Manufacturer Approval), Avmat started machining in a 24,000-square-foot facility in Ogden, Utah, to specialize in making the landing gear components it distributes for all types of commercial and military aircraft.

At the outset, Avmat purchased four Mori Seiki CNCs for sturdiness, reliability and precision. One was the NV 5000 VMC, and three were NL turning centers. With a strong recommendation from the Mori Seiki dealership, Avmat also acquired GibbsCAM for CNC programming.

Another challenge is that Avmat receives no solid models, making most of its parts from blueprints, some dating to 1965, with the balance through reverse engineering. Mr. Vander Meyden says this presents no problems, because he uses GibbsCAM for all the modeling. Gibbs includes modeling so

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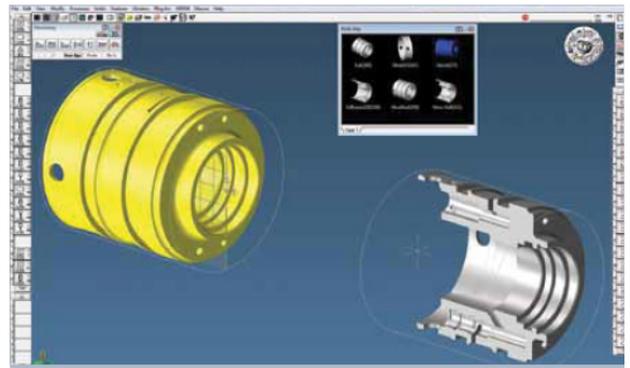
programmers can repair and modify geometry, make models machinable and simplify toolpath generation. "Our machines are configured in cells, with a PC at each station, so every machinist can use networked GibbsCAM to run simulations before machining and to improve the program," he explains. "But I also use it to model every part, then use the model to program parts, and QA uses it to program the Zeiss CMMs."

In this fashion, Avmat gradually took on more parts, increasing capability as they increased inventory. Nate Mayhew, operations manager, says they add new parts continuously. It is when part complexity exceeds machining capability or desired lead time that senior management relies on machinists to determine how best to make a part and what equipment is required.

It was an extremely expensive, high-replacement landing gear end cap—a part that holds bearings and port tools to control hydraulic motion—that led Avmat to add a more capable Mori Seiki. Mr. Vander Meyden says, "We had previously contracted this part, which has many internal and external features and very tight tolerances. It took the supplier 2 1/2 years to deliver good parts, and that's not surprising, since he needed 15 setups on CNC lathes and mills. You can't transfer a part from machine to machine 15 times and expect to hold tolerances."

The inability to supply the part at a moment's notice, plus the part's value and its potential profitability, led the shop owner to ask what the machinists needed to make it. Mr. Mayhew and machinists Mr. Vander Meyden and Scott Ostergaard included a Mori Seiki NT 4300, and Benz right-angle head and GibbsCAM MTM on their wish list. The NT is a dual spindle machine with upper tool group and lower turret, and live tooling Y axis on the upper tool. Mr. Vander Meyden explains that the right angle head was required to complete the part in a single setup, but that this was not an option

available for the NT. "Because there was no way to mount the Benz head, we asked Mori Seiki if they could integrate it. They engineered the interface, and our Benz head was the first right-angle head ever mounted on an NT. We had what we needed to make and drop the part complete in one setup." Mr. Vander Meyden was again behind the learning curve. "Switching axes for live tooling on an MTM – going from the XZ plane, to the YZ, to the XY – became the greatest challenge I had faced," he adds. "But telephone support from our GibbsCAM reseller, telling me what I needed to do, how to do it and when, got me through it."



Before Kyle Vander Meyden programs a part with GibbsCAM, he uses its modeling capability to create a solid model to drive multi-axis MTM toolpath and for QA to program its CMMs. The drawing and solid modeling screen with active tool-process-machining palette and operations list enables seeing work on both main and subspindles.

With the NT in place, Mr. Vander Meyden proceeded with modeling and programming the part with GibbsCAM, using several features with proven value. His most commonly used feature is saving and recalling machining processes—the combination of tools, feeds and speeds, and cutting depths for specific materials, primarily PH stainless steel, but also other steel alloys copper, bronze and aluminum—because it saves him a lot of time. Whenever an operation is required, he retrieves the process, selects the geometry and applies the process, completing the operation without having to specify variables.

Another frequently used process is subspindle transfer on MTMs. "Since I use it for all my parts, it's a huge time saver. I just pick the machine, and the software inserts the subspindle transfer for part cut-off or regular grab-and-transfer," Mr. Vander Meyden says. GibbsCAM's Sync Manager enables visual optimization of programs, turret synchronization and conflict avoidance. "A big run for us is 400 or 500 parts, but that doesn't mean we don't want to run programs as efficiently as possible," he continues. "We look at cycle times, and do what we can to keep cutting tools busy and optimize programs in Sync Manager."

Mr. Vander Meyden likes GibbsCAM's Cut Part Rendering with machine simulation because it allows the machinists to virtually watch a part being made, to know how machine components will move and exactly how the part will look during and after each operation. He uses machine simulation for complex parts and where tools work in close proximity and has prevented two crashes with its use. In both cases, the upper tool was going to hit the lower turret on an NT. In one instance, the tools were coming together to do pinch turning, and in the other the tools were working on opposite spindles, but the parts extended so far that the tools would have collided. "Even without causing injury, a crash can cost a lot in repairs, replacement and downtime, so Cut Part Rendering

with Machine Simulation saves a lot of time and money," he says. "The heads can run to \$30,000 or \$40,000 each, so Cut Part Rendering is huge for us." As for the 2 1/2-year part, as Mr. Vander Meyden came to call it, Avmat delivered good parts in 3 weeks. Mr. Vander Meyden says they would not have been able to make this part, and now many others, without the Mori Seiki MTMs and GibbsCAM. "In many instances, we'd be lost," he says, "We just couldn't make them with the accuracy, reliability, safety and delivery we've been able to achieve."

Since opening shop, Avmat has added two NT 4300s and an NZ 2000 for the most difficult work. With Y axis and subspindles on all the turning centers, the NLs, NTs and NZ do about 95 percent of the work, all programmed with GibbsCAM, which Mr. Vander Meyden also uses to program the NV 5000 VMC and Sodick wire EDM.

"The NTs and GibbsCAM MTM enabled us to make more difficult parts, make more types of parts, and cut production time and cost of others, some going from \$1,500 to \$500 a part," Mr. Vander Meyden says. "The technology paid for itself multiple times in just 2 1/2 years. With our backlog of 6 to 8 months on each machine, I could honestly use another NT."

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High Speed Machining Webinar

Date: June 12, 2013

Time: 2:00 PM ET/ 11:00 AM PT

Our Webinar Presenter: John Sare, GibbsCAM Applications Engineer

Join us for a look into today's competitive world of global manufacturing. By examining the primary factors affecting cost reduction in machining from a broader perspective, it becomes easier to see the impact that implementing changing technology can have on machine "up-time", reductions in "downtime", and personnel and shop-floor overhead.

Major topics being covered:

- ▶ What is High-Speed Machining (HSM)?
- ▶ Factors contributing to optimized HSM
- ▶ Why is HSM important in today's manufacturing environment?
- ▶ HSM Tools, Technologies and Methods
- ▶ HSM and Cost Reduction

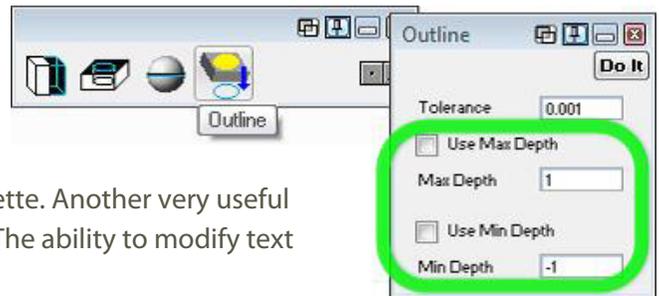
Click here to
Register Today!

Tech Tip

New Stuff in GibbsCAM 2013

We have introduced some very nice enhancements to the GibbsCAM 2013 release. In this Tech Tip we will highlight a few of our favorites.

Especially helpful in the creation of geometry is the “combine shapes” option in the shapes sub-palette. Another very useful improvement was made in the engraving function. The ability to modify text will save time when engraving.



Some of the most commonly used plug-ins were migrated to an appropriate location on associated process dialogs. They will be much easier to access without the need to open the plug-in menu.

Geometry

Geometry from Solids > Outline:

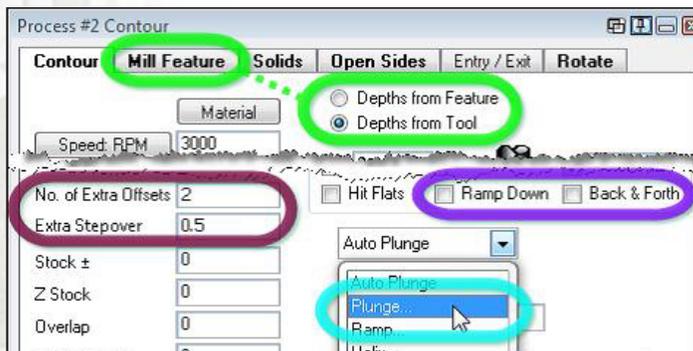
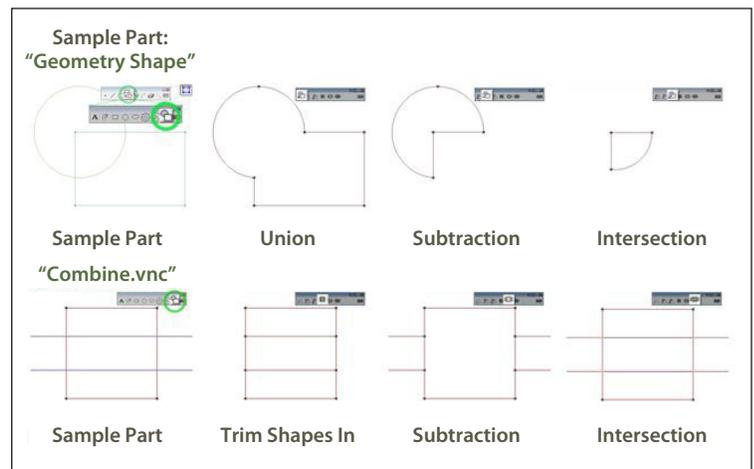
You can now specify maximum and minimum depths when creating outline geometry from solids. An outline is defined from the top view to the extents of the model.

Engraving parameters preserved with associated text:

Now, when you create text geometry from the shapes\engraving menu, it “remembers” it’s parameters (align point, font, spacing, and so forth), allowing you to edit and redo the element or reuse text parameters. You now have the ability to change font by selecting the existing characters and making a modification to your input and a “re-do” command.

Geometry Shape > Combine:

A new geometry palette lets you manipulate shapes as regions that can be combined, trimmed, or broken into segments.



Mill Contouring

Contouring has been enhanced in the following ways.

Ramp Down: Incorporates and improves upon the functionality of the Z Ramp Contour plug-in. For closed contours with vertical (not tapered) walls, creates a continuous spiraling toolpath with one finish pass at final depth. Unlike with the plug-in, the resulting operation keeps the parameter setting with Redo.

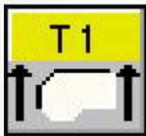
Back and Forth: Replaces the option buttons (One Direction / Back and Forth) formerly in the Wall Choices dialog. This allows you to specify how the tool moves from the end of one pass to the start of the next: either always cutting in the same direction (unselected), or else alternating between climb cutting and conventional cutting (when Back and Forth is selected).

Extra Offsets: Replaces and improves upon the Offset Contour plug-in and operation modifier. You can set a positive number of extra offsets and set a stepover value to generate multiple operations. Each operation's toolpath corresponds to an additional stepover.

User Plunge: Provides the same behavior for Contour as for other Mill processes. Allows you to set the (X,Y) of a plunge start point. The tool will feed from the Entry Clearance Plane to this point and then plunge into the material.

Pocketing

Outermost Shape as Boss: You can now specify "Outermost Shape As Boss" rather than as a pocket, without having to create additional geometry. This option will allow you to use a shape as a boss without the need of creating a boundary or applying an offset contour pass. This is illustrated in our sample parts directory located on our website and on the installation DVD. Sample part: **Outermost_Shape_As_Boss.vnc**



Bottom-up Hit Flats:

Performs specialized machining on thin parts containing many flat regions. For pocketing operations on solid bodies, the Bottom-Up Hit Flats plug-in cuts the deepest parts of a pocket first, at full depth, and then works upward, using material only, to mill every flat surface at lesser depth. The operation tile has a modified appearance to let you know that pocketing will proceed from the bottom up. This machining approach is most useful for thin parts of soft material, with many shallow flats.

Best practice: First create a pocketing process with a single Z step, specifying Hit Flats and Material Only. Generate the pocketing operation to verify results, and then apply the plug-in to reverse the sequence of depths.

Sample parts: **Bottom-up_Pocketing*.vnc**

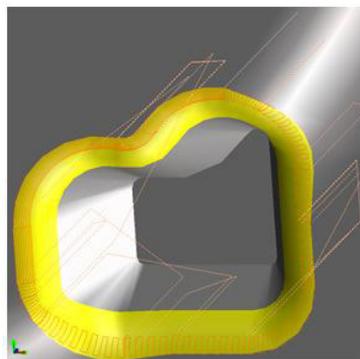
Surface Flow Cut

In SolidSurfacer at GibbsCAM 2013, version 10 .5 pre-Beta, the Surface Flow Cut strategy provides new functionality and a more powerful algorithm to better accommodate more kinds of blended faces.

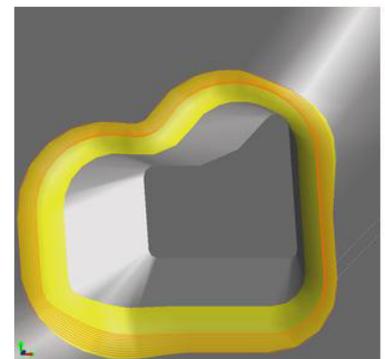
Spiral: A new option, Spiral, provides an alternative to Back and Forth.

Support for more kinds of blends:

Now smoothly handles most nonplanar fillets and other blended faces. When a contour's faces are not all "Long Edge" or all "Short Edge", the algorithm now looks at the contour as a whole rather than handling each face individually.



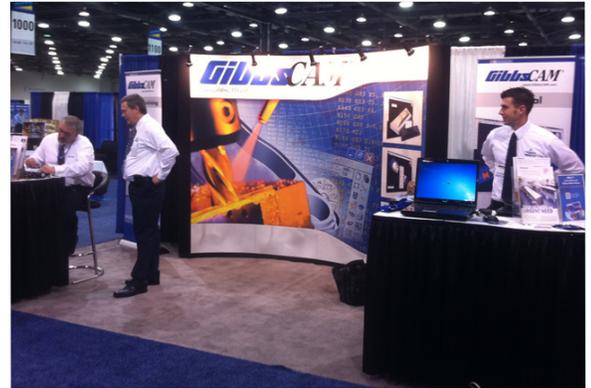
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GibbsCAM 2013

North and South America

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June 4-6, 2013 • Edmonton Expo Centre • Edmonton,
Alberta, Canada • Booth 1032 [Event Website »](#)
- ▶ **PTC Live Global**
June 9-12, 2013 • Anaheim Convention Center
Anaheim, CA • Booth 910 [Event Website »](#)



View a complete list of all upcoming events at GibbsCAM.com »

Europe

- ▶ **EPHJ**
June 11-14, 2013 • Palexpo • Genève, Switzerland • Booth TBA
[Event Website »](#)
- ▶ **EMO**
Sep 16-21, 2013 • Deutsche Messe • Hannover, Germany
Booth: Hall 25, Stand G30 [Event Website »](#)
- ▶ **Alihankinta Tradeshow**
Sep 24-26, 2013 • Tampere Exhibition and Sports Centre
Tampere, Finland • Booth: D199 [Event Website »](#)

GibbsCAM Training Schedule

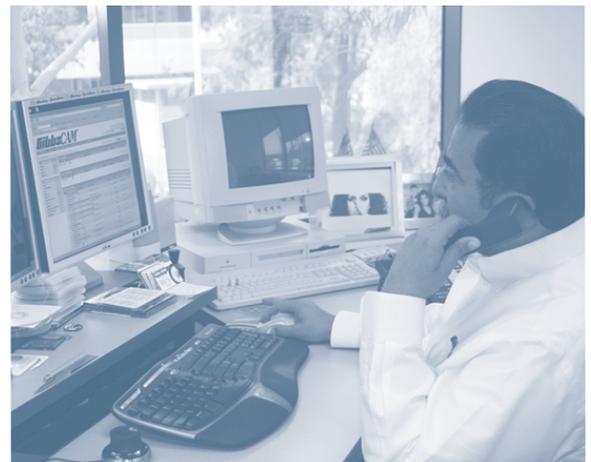
Standard Training

- ▶ **Intro Milling & Turning** June 11-13, 2013
(Geometry Creation, Milling, Turning)
- ▶ **Advanced CS** June 14, 2013
- ▶ **SolidSurfacer I** June 17-19, 2013

Advanced Training

- ▶ **SolidSurfacer II** June 20-21, 2013
- ▶ **5-Axis** June 24-25, 2013

Contact Sales today for our SolidSurfacer II and 5-Axis Training Promotional Pricing!



PLEASE NOTE: Dates and scheduling are subject to change. For additional information about Training Classes, please visit the GibbsCAM Training Page at: www.GibbsCAM.com, or contact the Sales Department at Sales@GibbsCAM.com or (805) 523-0004.

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