

CUSTOMER STORY | SYNERGY MOULDWORKS

Synergy MouldWorks Saves Up to 20% on Mold Delivery Time with Cimatron Software

Mold-making and custom machining shop uses integrated CAD/CAM software for up-front design collaboration with customers on complex, tighter-tolerance tooling.

[Synergy MouldWorks, Inc.](#) is a plastic injection mold maker and custom machining shop that specializes in higher-complexity, tighter-tolerance tooling for medical, automotive, and consumer goods including cap and closure, food packaging, and cosmetics. Located in Brantford, Ontario, Canada, it reduced its mold delivery time by up to 20 percent and improved its customer service by offering close, up-front collaboration for better part design when it implemented Cimatron integrated CAD/CAM software.

Designing Molds In-House

Previously, Synergy MouldWorks subcontracted its mold design work to engineering hosts that were using SOLIDWORKS and other software and used SURFCAM in-house for programming. When the shop opened in 2011, it switched to Cimatron for NC programming to get greater control over the NC toolpath. According to engineering manager Dave Wadley, “We noticed the power behind Cimatron and the CAD environment that enabled us to make some minor design changes. And that’s what led us to look into the mold design software aspect of it. Once we had that mold design suite, it was a natural progression for us to start designing our own molds in Cimatron.”



4-cavity injection mold for pill vial designed and manufactured with Cimatron

CHALLENGE

Achieve successful first shots by designing molds in-house instead of subcontracting to save time and money and maintain control over the design.

SOLUTION

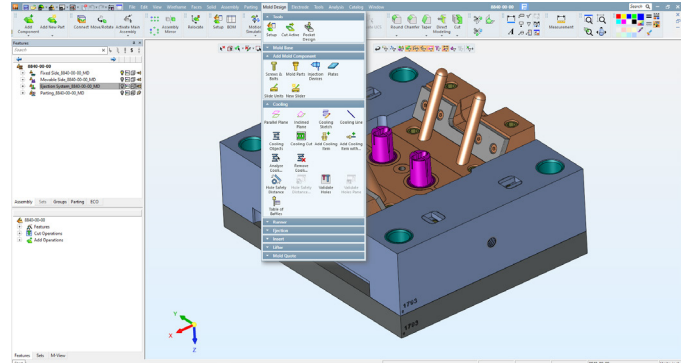
3D Systems Cimatron® integrated CAD/CAM software for mold design and manufacturing

RESULTS

- Saved 15–20% on overall delivery time for projects that include tool design and product development.
- Added customer value by collaborating closely up front for better part design.
- Maintained customer loyalty by easily accommodating ECOs without jeopardizing delivery time.
- Experienced greater control over NC toolpaths and better surface finishes.
- Reduced manufacturing time by picking smaller, successive cutting tools without cutting a lot of extra air.
- Saved 1–2 weeks of time per 10-week project—and therefore money—by identifying potential problems up front with motion analysis.

The switch to Cimatron for mold design resulted in a new specialty for the shop. Synergy MouldWorks now adds even more value by collaborating closely with its customers in the early stages of a project on things like improving part design for moldability and performance and mitigating any potentially high-risk part features that could lead to mold function problems down the road.

“We do get involved in a lot of new product development, some inventor-type stuff. It’s often heavily involved on the front end,” says Synergy MouldWorks president Cory Robertson.



Cavity half of a 2-cavity mold design showing mold design menu in Cimatron

Delivering Molds Faster

Robertson notes that once the company made the decision to move to Cimatron, it immediately noticed the value of having the native files designed and programmed in Cimatron. “We find Cimatron to be really nimble,” he says.

Integrated CAD/CAM Solution

Robertson also points out the value of having an integrated CAD/CAM solution. “Some 3D packages out there like SOLIDWORKS are geared towards product design and don’t catch everything. They’re not as well-rounded as Cimatron from the standpoint of: you’ve got mold design, you’ve got product design, and you’ve got NC all in one product. It’s product-development-specific. It’s one-stop shopping.”

Wadley agrees and adds, “Cimatron is a one-stop-shop for us that does our mold design, electrode design, and integrates seamlessly with our NC.”

Accommodating ECOs

Both Robertson and Wadley say Cimatron helps them maintain customer loyalty by easily accommodating engineering change orders (ECOs) without jeopardizing delivery time.

Robertson says that Cimatron helps them remain flexible and nimble during the initial design process.

Wadley adds, “Cimatron has a feature called the ECO manager that works well to modify your part and have it intuitively update the mold design as you go. You only have a few strings to pull to make it all come together. That’s pretty valuable for us when we have to go through and change these parts three or four or five times as the mold design is kicking off.”

With Cimatron, you can show the actual product change directly in a solid model and then update the design very easily to reflect that new concept and share it with customers. There are a lot more cases where the shop can hold to a timeline as it was originally quoted because the designer was able to update designs easily on the fly versus having to go back to the customer and ask for more time. “So that’s a business advantage right there. It helps us with customer loyalty because we’re not dropping deliveries or asking for more time. And there’s additional value in being able to accommodate their design changes and not have it impact them in any negative way,” Robertson notes.

Wadley also values the revision change alerts in Cimatron. It works seamlessly between engineering changes, design, and NC. As he updates models on the engineering side, the guys on the NC shop floor get a little status icon that comes up and lets them know that there’s been a revision change and that they need to know to look for a new revision. “It’s great that Cimatron does that,” Dave concludes.

“One of the huge advantages that Cimatron offers is how easily we can accommodate part changes. Based on having that versatility and flexibility, we’re saving 15–20% on an overall project that includes tool design and product development.”

— Cory Robertson, President, Synergy MouldWorks, Inc.

Pulling from Catalogs

Other time-saving features of Cimatron that Wadley frequently uses are cataloging and the quick creation of the bill of materials (BOM).

"It is fairly intuitive to add parts from Cimatron catalogs, which are awesome. They're fully-loaded from all the major companies like DMS, DME, and PCS. Cimatron provides all these fully-flushed-out CAD libraries. And as you pull these parts in, your bill of materials is automatically updated. So creating the BOM at the end of the job goes pretty smoothly and is less prone to error too since you don't have to hand write any of the part numbers. Really, it's just the click of a button and you're there," summarizes Wadley.

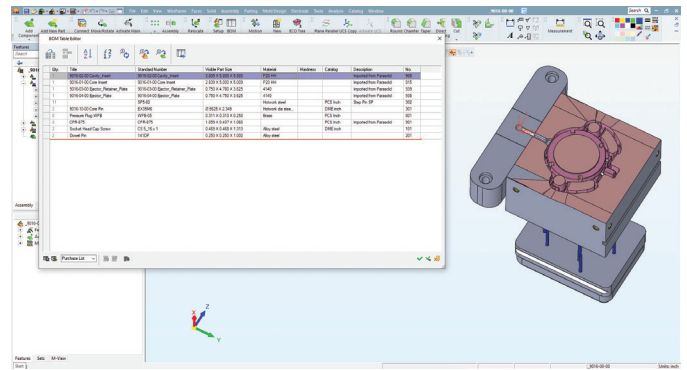
Reducing Manufacturing Time with Cutting Tool Options

Cimatron has also helped Synergy MouldWorks reduce manufacturing time.

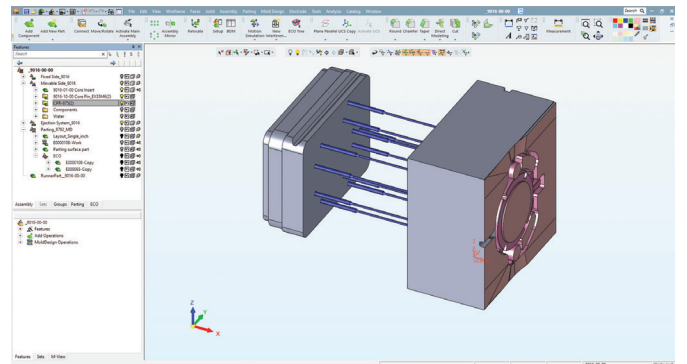
"Cimatron offers some cool NC features like re-machine procedures that lets us pick smaller, successive cutting tools without cutting a lot of extra air, which results in a huge time savings," says Wadley.

Using Motion Analysis to Identify Problems and Deliver Good-Quality First Parts

Another Cimatron feature that Wadley likes and uses to identify problems up front is motion analysis. There's a good kinematics engine built in for motion analysis that they use to see if their lifters or slides are working as intended. It'll note potential crashes, potential failure, if there's not enough stroke, and other problems that might have been missed. "That saves us time down the road. It's easier to see a potential problem at the beginning than at the end of the tool build in the prep. If we can catch that up front, we can save a lot of re-engineering, re-cutting blocks—and money in turn," says Wadley.



Cimatron BOM table editor for core side of mold base inserts set



Core side of inserts set of mold base in Cimatron

For example, they noticed that one of the lifters in a mold was going to cause an issue upon ejection. They hadn't noticed that until they ran the analysis. They were able to correct that in the design before any steel had even been cut, which saved about a week or two of delays and enabled them to deliver the part on time.

Wadley also notes that using motion analysis gives the shop a better chance for successful first shots, which are generally a tight timeline: "Motion analysis gives us a better leg up to have good-quality first parts and successful first trials."



Spring steel lifters, manufactured with Cimatron, shown in forward position to clear undercuts for pill vial cap

Ease of Use

Wadley also highlighted some Cimatron features that make his job easier and reduces button clicks for both mold design and NC programming.

For example, for mold design, putting in water lines and ejector pins is super easy and intuitive in Cimatron.

On the NC side, “The work got easier in Cimatron because you would realize gains quickly using features like NC templates and auto drill. Automating some of the monotonous tasks makes your life easier from an NC programming standpoint. Cimatron is always working on reducing the button clicks.”

NC programmer Matt Donald adds that Cimatron is very user-friendly in general: “After a couple of weeks, you really pick it up and it’s really nice. We’ve had new employees start and within two weeks they were full-on milling and finishing without having to ask questions—full-on making chips.”

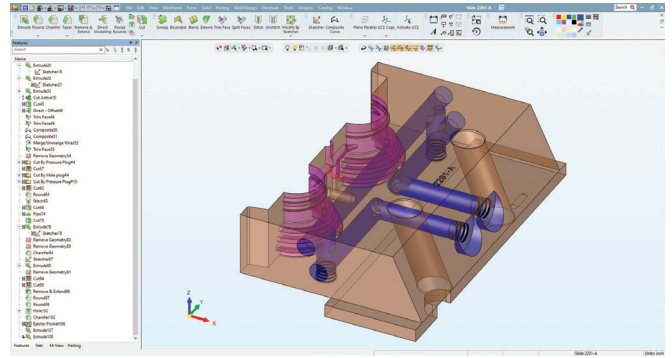
“Cimatron is a pretty easy software to get into. There’s nothing else that beats it, in my opinion,” concludes Wadley.

Improving NC Toolpath Control and Surface Finish Quality

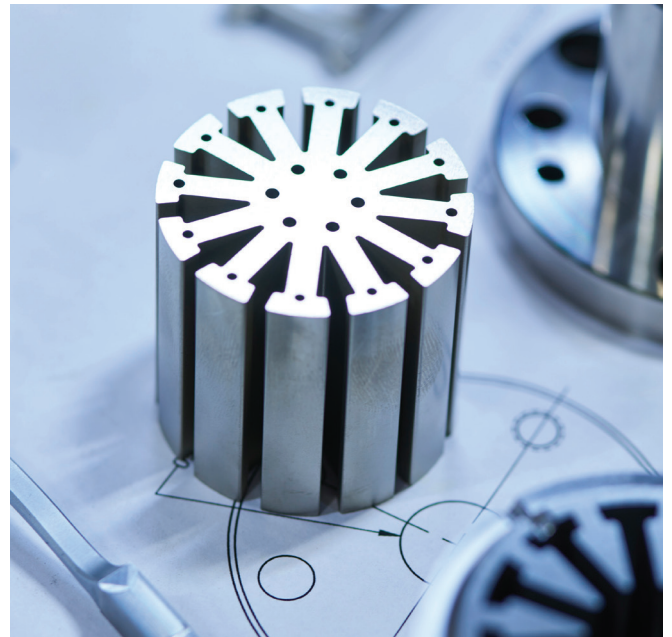
In addition to plastic mold injection, Synergy MouldWorks specializes in custom machining solutions, which Wadley says they would use the Cimatron NC package on its own for.

Previously, they were using SURFCAM for NC programming. “When we made the switch to Cimatron, we had greater control over the NC toolpath,” says Wadley. “We liked it for the control over the NC side of things. We had a greater control of manipulating the 3-axis toolpaths. Better surface finishes. Just the solid-based intuitiveness of the software was nice. Whereas in SURFCAM, we were working in a wire-frame environment.”

“Another deciding factor was how easily we could use solid models to manipulate our NC files,” says Robertson. “Because, in the mold industry, it’s not just simple cut-it-and-go kind of blocks. They’re all one-off pieces and they’re generally highly complex, so we have to make a lot of adjustments on the fly to make things better for machining. Cimatron allows us to do that on the shop floor with relative ease.”



Slide in transparent showing water circuit and part details for a 2-cavity slide mold in Cimatron



Complex wire-cut mold component for electrical winding designed and manufactured with Cimatron

There is no programming office at Synergy MouldWorks. Everybody does their own NC programming right at their workstation. “We do rely on the guys on the shop floor to be able to work and program their own NC machines, as well as look at assembly files to put a mold together. They don’t make general assembly drawings on the floor. That’s something Cimatron helps us with a great deal,” says Robertson.

“Cimatron works really well for us in the custom machining and mold-making field. Their NC strategies are great.”

— Dave Wadley, Engineering Manager,
Synergy MouldWorks, Inc.

Expert Technical Support and Trainers

Both Robertson and Wadley noted that the training and technical support offered by 3D Systems for Cimatron is excellent.

Wadley sums up his experience by saying: “Customer support from Cimatron has been second to none. They have a really excellent technical support team and they’re really always there whenever you need them to either provide support over WebEx or on the telephone. Or, if you need training, they’ll come to your shop. Their doors are always open. They’ve always been competent and easy to get along with—just a good bunch of guys.”

Regional User Group Meetings

3D Systems hosts regional user group meetings every year where Cimatron application engineers highlight aspects of new releases. “It’s great to meet these guys and talk about the software and the changes that have happened with the latest version,” says Wadley. “It’s not worth missing. Even if you take a few things away from one of those seminars, it can really help out.”



Electrode design using Cimatron electrode package on the shop floor at Synergy MouldWorks

Wadley also finds the community aspect of the annual user group meetings to be a bonus: “It’s good to network and meet others who are using the software. People start talking about how they use the software and that might trigger something in my mind about how I could do something differently, a bit more efficiently.”

New Mold-Making Features

3D Systems releases a new version of Cimatron every year as well as ongoing monthly updates of catalogs and small improvements, which Wadley says are simple to download and install, and the Cimatron control panel automatically alerts users when there are new software updates.

“I don’t like to sit on the updates for the new software versions because generally there are advancements every year that I’d like to see and take advantage of,” concludes Wadley.

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