SIEMENS

Case study

Tool paths to success

Choosing the right way forward in a changing trade

The proud and once booming trade of toolmaking has been challenged to find its place in a new century. Here's how one mold and die shop is using machine tool technology to invest in the future of its employees and grow its business.

The strategy for growth at True Die, Inc., based in Zeeland, Michigan, may be tied to the future of the mold and die trade itself.

Tim Rietsma and his brother Mike started their mold and die shop in 2000 wanting to continue their profession's proud heritage of skilled toolmaking. But with the adoption of evolving machine tool technology have come new ways of doing things, and soon the brothers faced an unexpected challenge to both their business and to their ideals.

The toolmaking profession had changed. Qualified toolmakers were becoming scarce. While the trade had always been based on the development of skilled and well-rounded toolmakers, the tech schools were beginning to turn out candidates for jobs in basic machine operation.

True Die's investment in this ROMI/Siemens machine tool package has helped the shop reduce operating costs, improve profitability and establish a more open platform for employee and business growth.

The ROMI D1000AP channels coolant through a high-speed carbide drill bit to flush out chips.

One-pass drilling has given True Die, Inc. the flexibility to manage both higher margins and more competitive pricing.

It wasn't long before Mike Rietsma remarked to his brother Tim, "You know, you don't see blacksmiths anymore either, unless you go to a museum."

Looking back, Tim Rietsma now observes, "When we started our company, I had fifteen years of experience building molds and my brother had twenty years experience building stamping dies. The toolmaker that we had in the 1990s, I don't think we'll ever see that type of person again."

Technology has a double edge

Contour Tool & Engineering, the original name of the company, was recently changed to True Die with a new ownership investment, the addition of new round product tooling capabilities, and a renewed commitment to the toolmaking trade. As Contour Tool, the company has been a one-stop resource for OEMs needing an integrated knowledge and approach to building molds for injection molded plastic parts. As True Die, Inc., leadership says the company's heritage can now be more fully leveraged.

"As we design and machine a tool, we're thinking about what goes into the finished part," Tim Rietsma explains. "We see a problem at any step and we are able to solve it. Once that's done, the rest is basically the machining. I've had job placement services come to me offering their services. I tell them I need a mold-maker or a die builder. They come back with someone who went to tech school and who knows how to run a basic machine to cut a part. Then they say, 'Well, that's what you do here, right? Cut parts?'"

For True Die's leadership team, two decision paths have emerged: Invest in newer basic machines that give a machine operator the ability to cut a part, or invest in more capable machine/control packages that enable employees to build their skills, their careers and the company.

In 2014, the company bought its first ROMI machine, driven by their first Siemens CNC. The ROMI D1000AP vertical machining center featured the Siemens Sinumerik 828D control and drives package.

"We initially wanted higher speed and accuracy," Tim Rietsma recalls. "With the molds, you cut both halves of the tool, then both halves need to fit tight to each other within one-thousandth of an inch. If your machine can't do this, you must spend a lot of time with a hand grinder on a bench."

Doing away with bench grinding proved to be one of the immediate paybacks of the ROMI-Siemens investment. Any grinding related variances in precision and surface quality were soon avoided and the profitability of the business was boosted by the increased capacity for throughput.

"Three years ago, most of our surfacing work was done at a feed rate of around fifty to sixty inches per minute," says Rietsma. "With the Siemens and the ROMI combination, some of our feed rates have already approached two hundred inches per minute; and what comes out of the machine is a part cut in much less time, and that offers repeated high quality to the customer."

The new machine/control package has yielded other important returns for the company that continue to make the investment look all the better with each passing day.

One-pass drilling

The ROMI D1000AP vertical machining center features integrated cooling during high-speed drilling. The coolant flows through the drill bit to flush the metal chips out and away from the flutes. Carbide drill bits last much longer and drilling cycles have been reduced from five minutes to thirty seconds.

Among the advantages of the Siemens Sinumerik 828D control is the ability to produce a high quality part in the least amount of time.

Surface quality, velocity and accuracy can be synergistically programmed to optimize machining motion using the "Advance Surface" feature.

Now the shop can drill a hole in one pass, rather than repeating up-and-down passes to clear metal chips from the hole and bit. "So the price for a tool may be quoted at twenty-five dollars for each of five holes," Tim Rietsma explains. "Whatever the going rate, we can produce five of those holes in the time it used to take to produce one."

This feature alone gives True Die, Inc. the flexibility to increase the company's margins or to strategically price jobs to win new business, and sometimes both.

Faster-to-the-finish

At every turn, the mold and die professionals at gives True Die have discovered something remarkable about the Sinumerik 828D CNC that drives their new ROMI machining center.

An important discovery was the ability to program the machine to minimize the time it takes to cut a part. A feature called "Advance Surface" enables the shop to optimize mold-cutting velocity, accuracy and surface quality for the most efficient machining motion. So for example, machine speed (velocity), can be reduced when the tool path requires the precise cutting of sharp corners (accuracy), and accelerated when machining through rough cuts to produce a part to the exact finish requirements (surface quality).

"It's a feature that is over the top of any control I've ever seen," Rietsma says. "With a couple short clicks on the control, I can tell the machine that a particular block is not so fussy on tolerance. I can in effect say, 'open the tolerance up' and that will increase the speed of the machine through that sequence. We can get the surface finish that the mold requires and the maximum speed of the machine all at the same time."

Beyond easy-to-use

Just about every brand of CNC on the market claims to be easy-to-use, but seeing is believing, Tim Rietsma says. "Siemens has definitely outdone all their competitors. The CNC has full graphical support. You see what you're doing while you're putting in a program. With a lot of the other controls, you're looking at the book trying to figure out what things mean."

That said, investing in an easier-to-use Siemens control that drives an advanced ROMI machine was not the end-game for True Die, Inc. The greater goals were the enablement of the shop's people, the betterment of the business and contributing to a toolmaking profession that was built on knowledge and skill development.

Beyond "conversational," the Siemens-ROMI investment is enabling the shop's employees to build their knowledge and skills. "We're still learning on the machine, learning every week," says Tim Rietsma. "When the machine hit the floor, we needed to make parts. We didn't have time to really learn the CNC. And then as the weeks go on, we learn a little more. The sky's the limit with the Sinumerik 828D."

Other proven returns on the machine/control investment have been the faster production of consistent quality molds; leveraging their newfound flexibility to produce different parts for different types of customers on the same machine; the ability to name and call up any of the tools in the tool holder; reducing mold rib cutting from a 20-hour off-line EDM process to a 1.5 hour milling process at the machine; eliminating hours of "homing" restart time in the mornings due to a Siemens absolute encoder that holds the exact previous setting; and being able to download earlier Haas and Fanuc files into the Siemens control with no losses and greater machining flexibility to gain.

Brian Brown, True Die, Inc. owner and president says, "... our business is uplifted by companies like Siemens and Romi, who understand the challenges of our industry."

Looking ahead

Brian Brown, True Die, Inc. owner and president, is especially proud of the company's position and outlook on toolmaker education. A journeyman toolmaker himself, he is passionate about protecting and growing the trade through the adoption of more enabling technology and more robust education.

"Our business has a state certified apprenticeship program," Brown points out. "And our business is uplifted by companies like Siemens and ROMI, who understand the challenges of our industry. In fact, to further enhance our deep draw mold capabilities, we just purchased our second ROMI machine...a C420 lathe with a Sinumerik 828D control."

The toolmaker's trade may have changed, but for True Die, Inc., the way forward includes investing in more open-ended technology that will build knowledge and skills, encourage inventive thinking, and reward career-minded workers who bring new ideas to the shopfloor.

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