

STECKER MACHINE

Example Tooling Projects

SMC

CNC Tooling Improvements
and Partnerships

It takes the right tools to do the job right. Not only **knowing** what tool is needed, but also when to **invest** in tools and how to implement new technology. Here's how Stecker Machine approaches each step.

KNOWING TOOLS

Keep an open mind, listen, and be patient with vendors, no matter how "beyond basic" your shop may be.



Even the latest and greatest CNC machines are ineffective without the right tooling. And most often, a project's success depends on optimized tooling.

- Teamwork — Machine shops' engineering, tooling, and operations crews evaluate project needs
- Attitude — New ideas are embraced by "no fear" thinking
- Analysis — Make it work on paper first, then invest in production
- Perseverance — Bumps are part of the process; focus on the solution

What makes for a trusted vendor partnership?

True story: During an initial meeting with a potential tooling partner, its rep presented Stecker Machine with a very basic (nearly laughable) demonstration kit. That rep quickly learned that Stecker is far beyond basic. Stecker took the time to learn that tooling partner's strengths and, after a successful project, the partnership grew.

Moral of the story: Keep an open mind, listen, and be patient with vendors, no matter how "beyond basic" your shop may be.

INVESTING IN TOOLS

Stecker Machine consistently upgrades our cutting tools to keep up with technology and achieve superior levels of cost and quality. Our team of engineers, production pros, and quality control experts find areas for improvement — both for cycle time reduction opportunities and correcting issues — and then we work closely with our distributors and tool reps to prioritize needs and obtain the necessary tools.

The investment in high-quality, custom tools pays off in long-term, reliable performance.

- Payback — Fast cycle times, few issues, and long life equals the real lowest price
- Experience — Nothing beats a track record of implementing new CNC cutting tools
- Confidence — Higher upfront tool costs can yield the lowest total cost of ownership
- Smarts — Machine shop pros ask vendors the right questions for a smooth process that's custom-made for longevity

What adds up to satisfied customers?

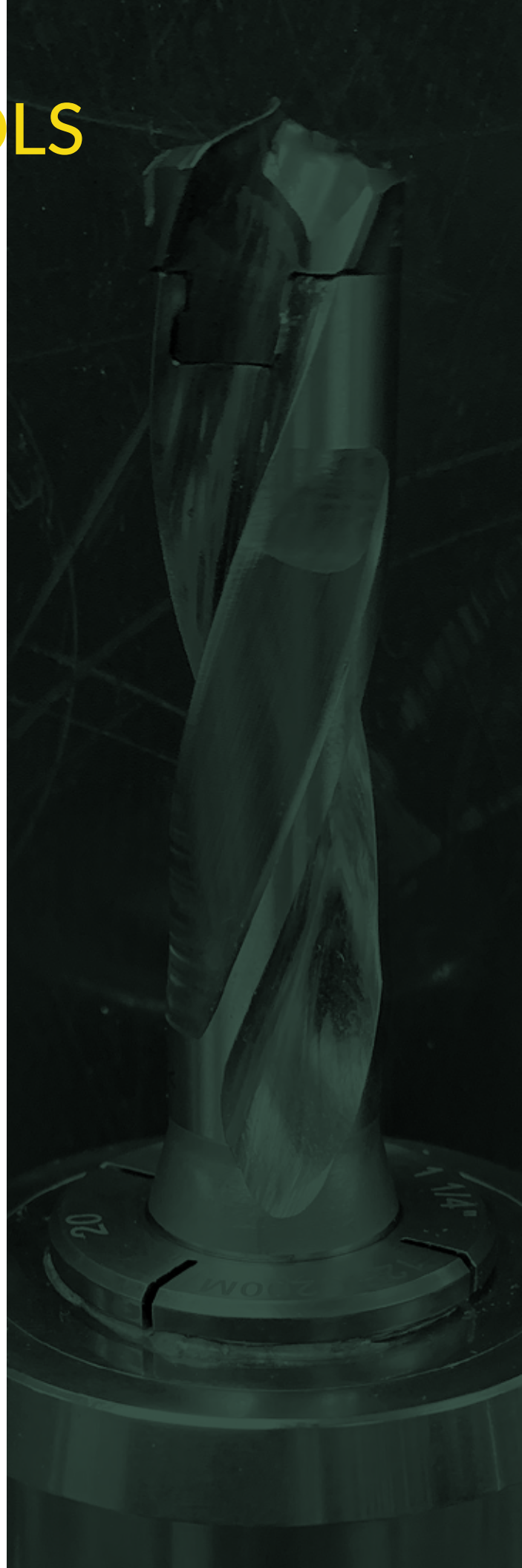
CNC Machines (best-in-class equipment)

The Right Tooling (significant investments)

Stecker Know-How (priceless experience)

+ _____

Exceed Expectations (it requires all 3 to provide customers with exceptional products)

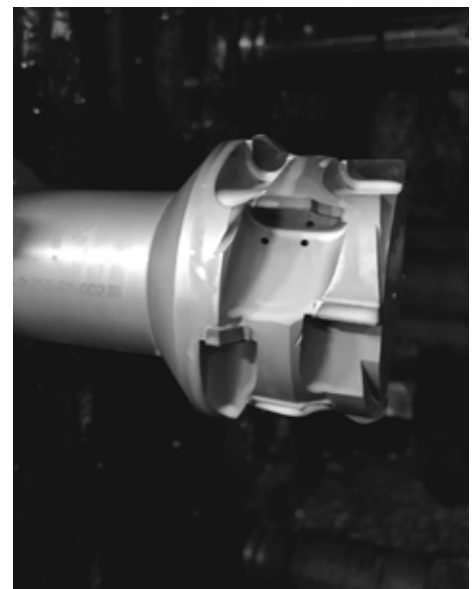


IMPLEMENT TOOLING SOLUTIONS

The right business partnerships create valued solutions and achieve wins for all four parties: CNC machine shop, distributor, tool supplier, and customers. The right tools:

- make parts easier to manufacture (shop has confidence in tooling)
- grow trust (distributor knows shop's RFQ is solid)
- build momentum (tool vendor confidently proposes production issue solutions)
- and are less expensive (customer is thrilled)

Implementing successful tooling solutions deepens relationships, meaning the machine shop could receive prioritization and expedited projects. Plus, the distributor may be willing to help with some cost and stock sharing for the machine shop to get projects in the door.



Cutting tool improvement example #1 — Radial Cutting Tool

Challenge: This form tool, which plunges into a part while turning to cut, should be fast and durable, but it isn't performing. The tool doesn't meet life expectancy, it fails prematurely, and it's expensive, so early failure is costly.

To accommodate a material change, Stecker needed to run a temporary option, an end-mill, to achieve life. The end-mill is much slower because the spindle must feed to trace the feature with the small diameter tool to make the cut. This option was more durable, but the cycle time was too slow.

This shows a feature consisting of three concentric bores. The old tri-bore tool ran slowly to prevent end-insert chipping out and cutting the interrupted feature. The dual-bore and guided reamer is much faster; both tools now run at optimal speeds.

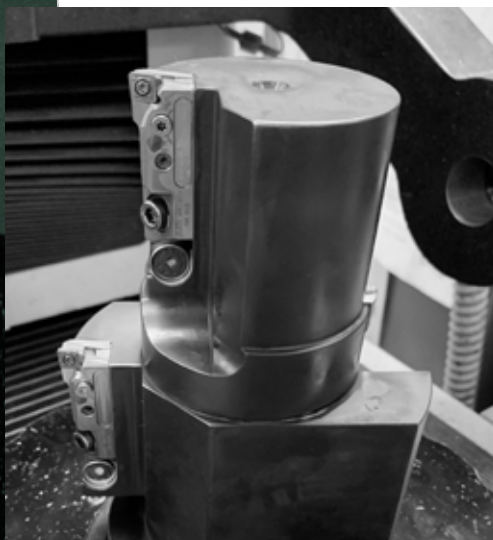
Solution: The **polycrystalline diamond (PCD)** form tool from Gühring is a solution that falls between the two above. Its geometry allows it to cut three features at once with a shorter feed due to its larger diameter. It even runs faster than the form tool in this application due to rigidity issues with running the form tool.

Cutting tool improvement example #2 — PH Horn DR System Reamers

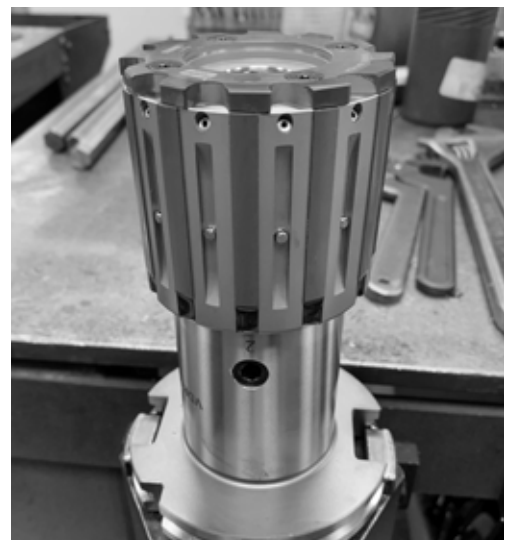
Challenge: A tri-bore tool ran slow to accommodate an interrupted feature. There was an opportunity to improve since slowing the tri-bore tool for one feature affected the cycle time to cut all three features. The tri-bore tool had a long cycle time mostly to avoid chipping out inserts on the deepest, interrupted cut. Plus, the bore required operator adjustments during the runtime.

Solution: Stecker switched to a dual-boring bar and a reamer, which allows the dual-boring and reamer each to run optimally. Ryan of PH Horn provided an extra stout, guided reamer with coolant through to every edge. The guided tool body keeps the reamer from walking, making the interrupted cut. The dual-bore/guided reamer runs faster, reducing tool cycle time by 60%. The reamer holds through interrupt, and there's better size and roundness control from reaming. Plus, no runtime adjustment is needed (resulting in less scrap).

Before



After



Cutting tool improvement example #3 — IT.TE.DI Face Mill

Challenge: A part material change caused a life issue, so Stecker searched for an improvement. In addition, tooling technology is always advancing, and there was an opportunity to upgrade.

Solution: Stecker worked with AJ (from PTS) and Matt (from Ingersoll) to upgrade to IT.TE.DI face mills in several applications, diligently finding, testing, and implementing until successful. The change cut the overall part cycle time by 11%; when applied to a very high-volume part, this amounts to a huge savings.



Life was also increased from using a polycrystalline diamond (PCD) insert with more cutting edges. The team worked through upfront cost and stocking issues to close the deal. Stecker leveraged this initial hard work into more applications, reducing cycle and extending cycle times on more parts.

Cutting tool improvement example #4 — Ninety-Degree Head

Challenge: Using different technology can make or break a part, or greatly reduce cycle time. Some features are difficult to access. Adding operations to re-orient the part access features takes added cost.

Solution: Ninety-degree heads are used to reach inside parts where features can't be accessed straight from the spindle. In some cases, this is the only method to make the part, while in others, it can save a re-orientated operation step and cost.



The expensive and heavy-duty ninety-degree tool showing the cutting tool. It holds a CAT40 taper tool and mates to a CAT50 spindle. There are many light-duty options that directly hold the tool, but these can't perform properly in Stecker's application.

Jake stands next to the ninety-degree head in a large CNC spindle. The cutting tool is aligned in the x-axis, allowing the spindle to reach into the part, move in the x-axis, and cut an internal part feature.



Cutting tool improvement example #5 — Spindle Speeder

Challenge: Using different technology can make or break a part, or greatly reduce cycle time. Not all machines are created equal. In some cases, a limited spindle speed holds back production.

Solution: A spindle speeder can increase a tool's RPMs, allowing for faster feed and maintaining the set chip load. Stecker implemented a mechanically driven speeder to drill faster. Alternative coolant driven speeders may be fast but lack power.

The speeder includes mechanical gearing that multiplies the spindle RPMs to the tool output. With a cost of \$7,700 not many shops would even try this solution.

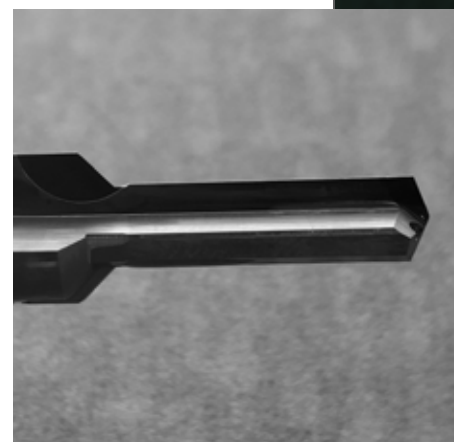
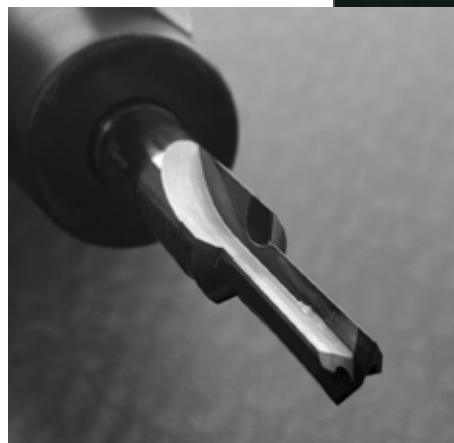
The improvement has the potential to save 3%. While this doesn't sound significant, it amounts to increasing output by a few parts per shift and enables Stecker to get jobs done faster.

Spindle speeder is used with a small end mill to speed up cutting a groove.

Cutting tool improvement example #6 — fully tipped PCD drill

Challenge: Competitive CNC shops always need to optimize production. Engineers search for cost savings from reducing production cycle time and extending tool life needs to exceed tool costs.

Solution: Dan worked with Sandvick to design and implement a custom fully tipped PCD drill. Improvements over a carbide drill increased the cutting feed from 72 inches per minute (IPM) to 100 IPM for a 38% gain. Tool life is expected to increase by more than a factor of twenty. The tool life will exceed two years in this constantly running application.



Fully tipped PCD M6 step drill is shown



Dan and AJ review the spindle speeder

DISTRIBUTOR TESTIMONIAL

Stecker Machine Company is a well-known name in the manufacturing and machining industry. They have built a solid reputation for both quality and precision. In my opinion, this reputation has been established through continual process improvement. Whether it be robotics or tooling, their team of engineers is very technical, dedicated to efficiency, and always implementing the best tool for the job. This is what sets them apart from your standard machine shop – for instance; by using a high-performance reamer versus an adjustable boring bar, this gives them 10x better feed rates, superior hole finishes and better repeatable accuracy...therefore parts can be produced at a much higher volume and in a trustworthy manner. The folks at Stecker are always on the lookout for process improvements and cycle time reductions like this and are not afraid to be pioneers, paving the trails by testing and implementing some of the newest tooling technologies out there today.

- A.J. Graceffa, *Field Sales Representative*

PT Solutions **f in**

Looking for more guidance in selecting CNC machining tools? Reach out to Stecker at [920-726-4526](tel:920-726-4526). We look forward to hearing from you!



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