



THE TRUE COST OF COOLANT

Learn how automated coolant management systems can help you achieve true ROI in your CNC machine shop.



There's something swimming around in all those coolant barrels you buy. It's something you may not see. But it's there. And it costs you money. Maybe lots of money. What we're talking about are all the hidden costs of CNC coolant. While it's tempting to arrive at your total cost of coolant (TCC) by multiplying coolant costs by usage, that approach only tells a small part of the story. The big story also includes:

SIMPLE COST PER FILL

It costs you something each time someone has to monitor, mix, fill and report a CNC machine. Multiply this cost by the number of CNC machines in your shop, and you'll get an idea how quickly this expense adds up over days, weeks and years.

PRODUCTIVITY GAINS

Machines that have the correct concentrations of coolant are more likely to run at their maximum rate for more hours of the day. And every extra minute the spindles are spinning puts money back in your pocket.

MACHINE STOPPAGES

Machine stoppages due to low coolant are a costly source of downtime. Automating the coolant management process reduces the number of stoppages for each machine, keeping your uptime high.

TOOLING WEAR

One benefit of automatic, consistent coolant management with the right concentration is that your tools don't wear as quickly. Purchasing fewer tools over the course of a year cuts down on a significant expense.

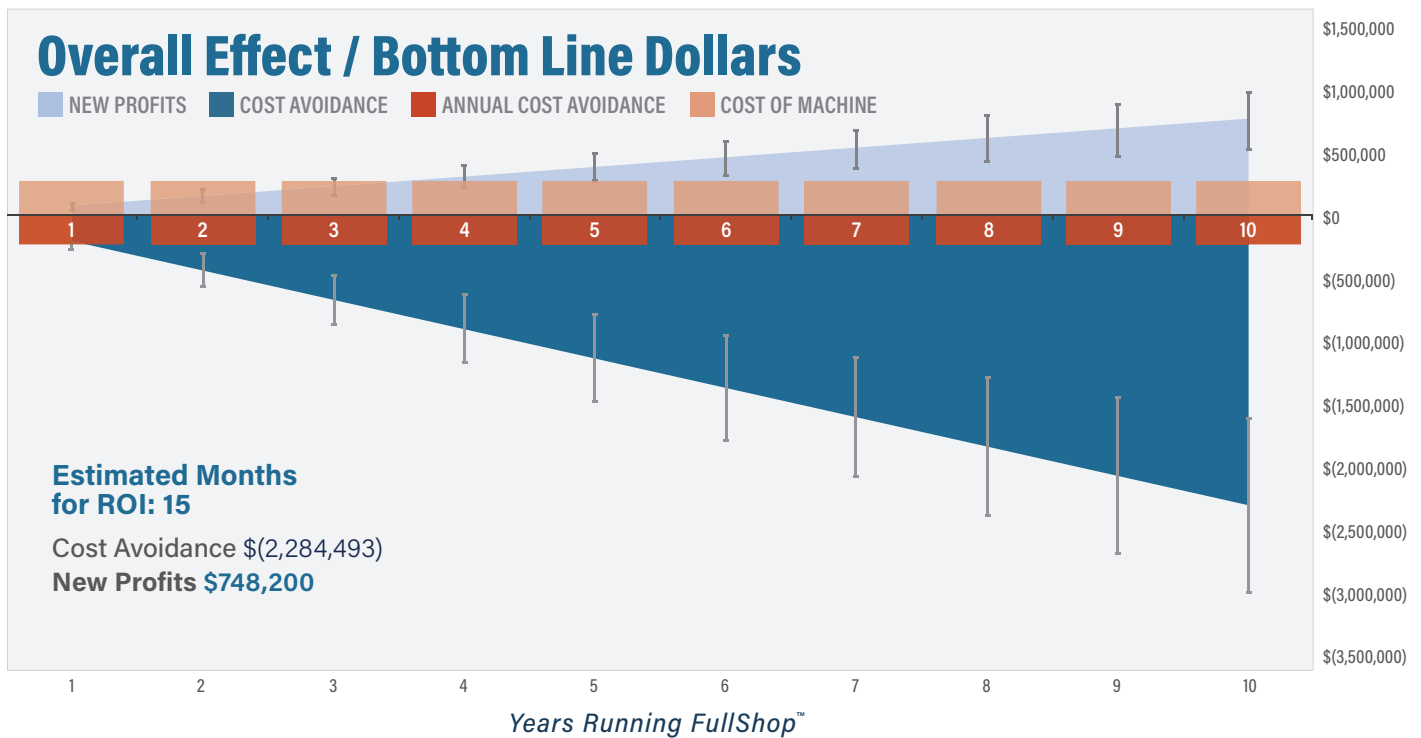
COOLANT CONCENTRATION

Oftentimes, machinists err on the side of using higher-than-necessary coolant concentrations in their machines. Using an automated system to keep these concentrations within the correct range means you spend less on coolant — and save money.

OPPORTUNITY COSTS

There's also a hidden opportunity cost associated with taking workers away from more productive activities each time they need to dump coolant into the sump. And these interrupted minutes per sump per shift add up — in some cases, to the equivalent of 15 minutes per shift per worker. Put another way, would you let each of your workers leave 15 minutes early every shift, every day?

The good news is you can address these hidden coolant costs with automatic coolant refill systems like the *FullShop™ Automated Coolant Management System*. In this white paper, we'll explore how this system can help you achieve true ROI, helping you produce year after year.

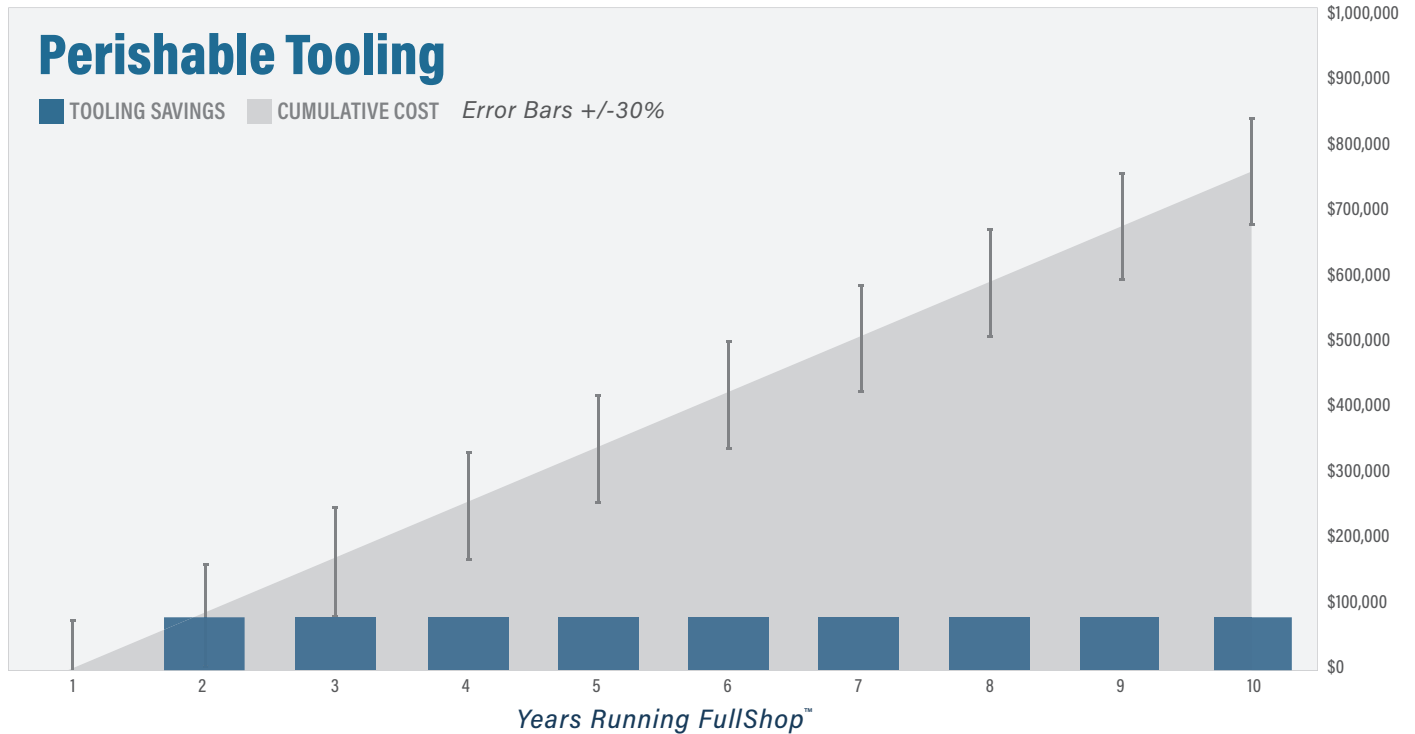


Less Tooling Costs Means Tens of Thousands of Dollars Back in Your Pocket

When evaluating the performance of an automatic coolant refill system, one of your first questions is probably about your return on investment (ROI). If you're like many shop owners or operations managers, it's tempting to consider ROI only in terms of labor costs. But while labor does contribute to your ROI, it doesn't tell the whole story — especially where coolant is concerned. The reality is coolant automation can help you maximize ROI beyond just labor costs alone. One of these other areas is tool wear.

Automatic coolant refill systems not only deliver makeup coolant to CNC machines, but they also deliver predictable in-sump concentrations. We accomplish this by individualizing each CNC machine's makeup percentages according to an optimal setting, which we optimize using a basic trend line. Thanks to this long-term predictability, your preferred brand of coolant runs optimally and delivers on the promise of extended tool life. And when your tools don't wear as quickly, you buy fewer of them over the course of a year. It's as simple as that.

How would a 5- to 10-percent decrease in tooling cost affect your bottom line? What about 25 percent? For shops that cut exotic material, these savings can be dramatic. While your use case is unique, we find that a high percentage of our users benefit from having more predictable coolant concentrations. Many shops in our demographic spend \$100,000 or more a month on tooling, so these cost savings really do add up.



Are Those Thousands of Minutes Invested in Coolant Top-Offs Free?

It costs you something each time someone has to monitor, mix and fill a CNC machine. And when something goes wrong, you have to pay someone to fix it. All these costs add up — especially if you have multiple CNC machines in your shop running multiple shifts. Let's break down a few scenarios using typical data. An average CNC machine should get filled once per shift — sometimes more, sometimes less. The time it takes to do this typically ranges from five to 20 minutes, so let's use 10 minutes at a cost of \$0.50 per minute (\$5.00).

USE CASE #1: A shop that runs Monday to Friday (three shifts each) plus Saturday and Sunday (two shifts each), totaling 19 shifts per week:

- 12 CNC machines = 228 top-offs = \$1,140 per week = 2,280 minutes invested weekly = 38 hours invested weekly
- 24 CNC machines = 456 top-offs = \$2,280 per week = 4,560 minutes invested weekly = 76 hours invested weekly
- 36 CNC machines = 684 top-offs = \$3,420 per week = 6,840 minutes invested weekly = 114 hours invested weekly
- 72 CNC machines = 1,368 top-offs = \$6,840 per week = 13,680 minutes invested weekly = 228 hours invested weekly

USE CASE #2: A shop that runs Monday to Friday (two shifts each), totaling 10 shifts per week:

- 24 CNC machines = 240 top-offs = \$1,200 per week = 2,400 minutes invested weekly = 40 hours invested weekly
- 36 CNC machines = 360 top-offs = \$1,800 per week = 3,600 minutes invested weekly = 60 hours invested weekly
- 72 CNC machines = 720 top-offs = \$3,600 per week = 7,200 minutes invested weekly = 120 hours invested weekly

Opportunity Costs Are Real. You Have Better Things to Do.

Imagine redeploying 13,680 or 7,200 minutes (120 hours) of labor to more meaningful tasks. How would this affect your bottom line? Automatic coolant refill machines automatically replenish coolant before it runs low, eliminating the need to manually refill coolant and saving you money and time on each event. Some systems even include real-time Internet of Things (IoT) capabilities, such as email notifications, data reporting and analytics, which help you proactively address maintenance issues before they arise.

How To Reduce Machine Stoppages

Machine stoppages due to low, flooded or concentration that wreck havoc are a costly source of waste and downtime. One way to put an end to these stoppages is to automate your coolant management process, increasing your profit. Not only will your sumps always be full at the correct concentration, but they will benefit from IoT-enabled features that automatically alert you to coolant levels that are too high or too low, allowing you to resolve issues before they cause downtime.

For example, these IoT-enabled capabilities recently made us aware of clogged aluminum chips that had trapped coolant inside the machining area of a CNC machine, causing coolant to slowly drain back to the sump. Instead of experiencing downtime and costing hundreds of dollars in damages, we intervened, resolving the issue and keeping the spindles spinning.

Now, let's plug in some numbers. Let's say you run a machine shop with 50 CNC machines, and over the course of an average week, 10 machines experience a stoppage lasting roughly 30 minutes. In this scenario, you're losing precious spindle minutes five hours per week. At \$100 per hour, you're losing out on \$500 in revenue weekly and \$26,000 annually. For shops that engage in lights-out manufacturing, the time it takes to recover from stoppages when no one is around can be substantial.

By implementing coolant management systems with automatic coolant alarms, you can stay focused on machining and significantly reduce the number of machine stoppages in your shop. Getting those hours of downtime back each week translates to extra profit that your bottom line reflects at the end of the year.



***Your checklist
won't work,
and you know it.***

What Every Extra Minute of Spindle Activity Means for Your Bottom Line

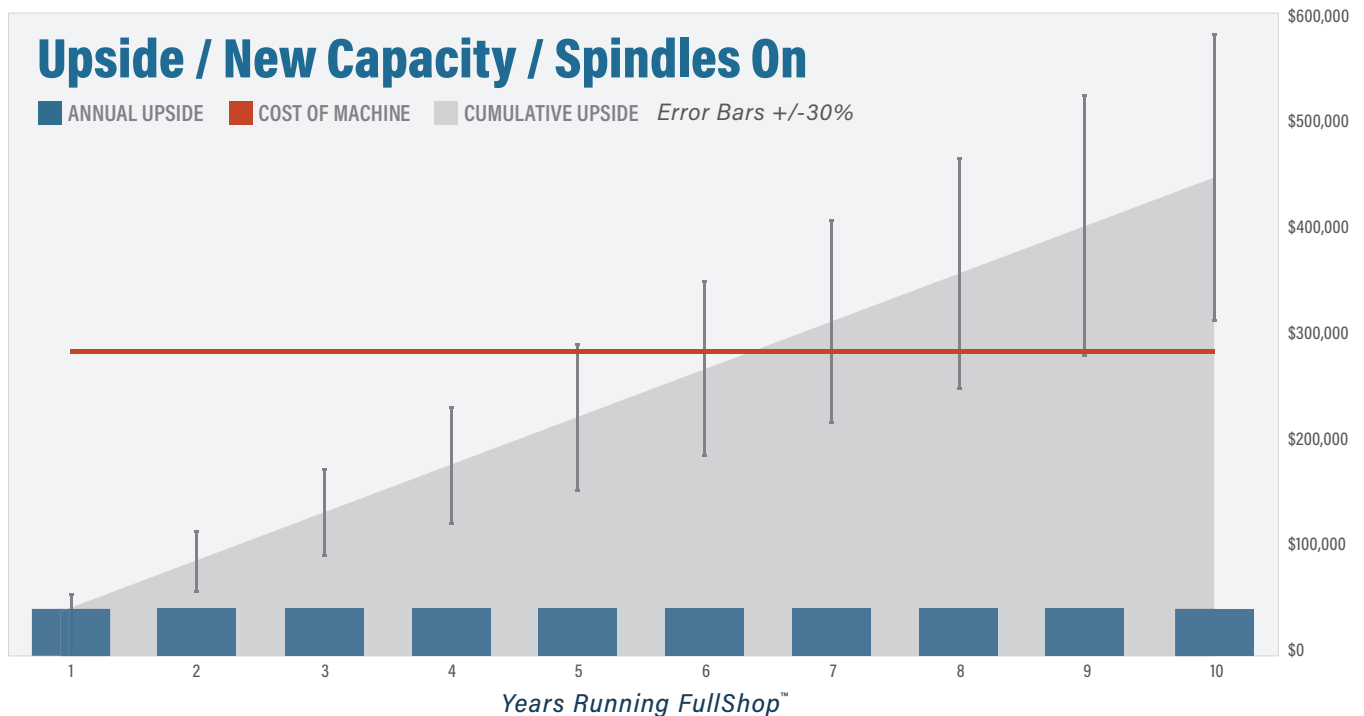
It's typical for machine shops to spend 10 to 20 minutes a day per CNC machine, distracted by coolant-tending at some point during a shift. One of the upsides to automatic coolant refill machines is the ability to top-off CNC machines with the correct concentration — no manpower required. When workers are freed up and a machine has the correct coolant concentration, it's more likely to run at its maximum rate for more hours of the day. Every extra minute the spindles are spinning puts money back in your pocket.

Let's break down what these productivity gains mean for your ROI. Systems like FullShop™ automatically provide each CNC machine with an individualized top-off ratio that is optimized for a specific machining process, keeping the spindles spinning at their maximum rate. This capability unlocks incremental gains in productivity that begin to pay off after just one week of operation. When you extrapolate these values over weeks, months and years, the additional profit is substantial.

As an example, let's consider a machine shop with 100 CNC machines that runs 17 shifts per week — a first, second and third shift from Monday to Friday, as well as two additional shifts over the weekend. At an outbound dollar rate of \$100 per hour and a 30-percent profit rate, the shop will experience the following financial gains with only one extra minute of spindle activity per shift:

- **\$850 of new profit per week**
- **\$3,655 of new profit per month**
- **\$43,860 of new profit per year**

Based on these productivity gains alone, the machine shop will easily make back its money on a FullShop™ machine after only a few years.



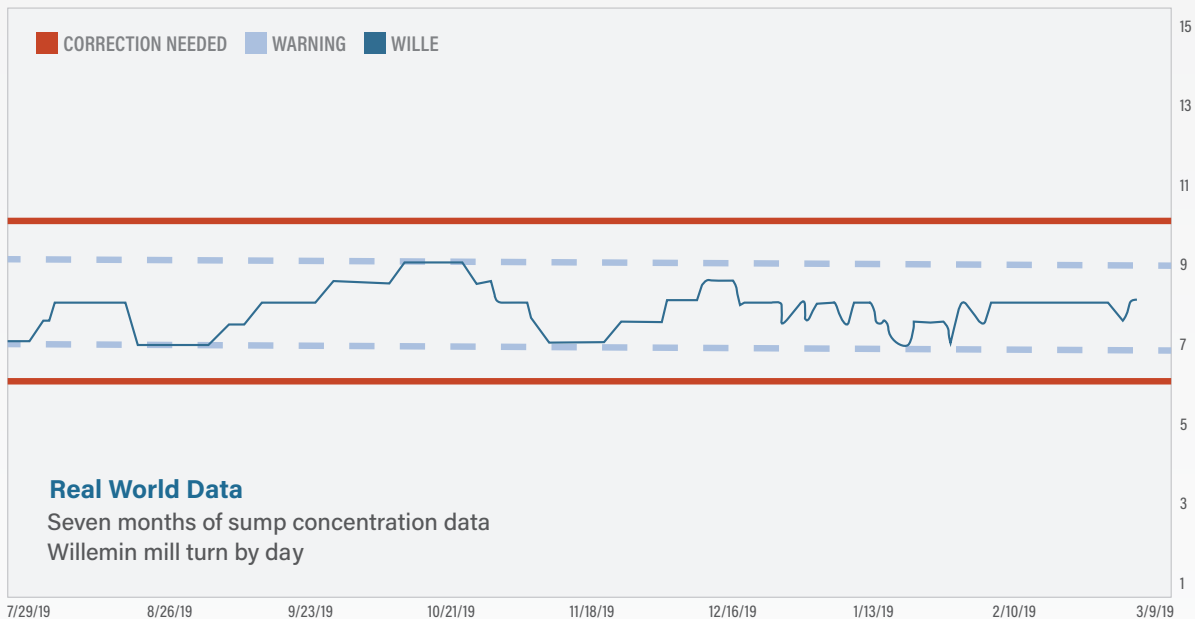
Cut Costs by Keeping Coolant Concentrations Within the Correct Range

In the majority of machine shops, coolant management in CNC machines is still a manual operation. Machinists tend to err on the side of using higher-than-necessary coolant concentrations, driving up what you spend on coolant each year. Automatic coolant refill machines overcome this challenge by keeping coolant concentrations within the correct range, meaning you spend less on coolant.

To understand these savings better, let's crunch some numbers. In the following scenario, the cost per tote of coolant is \$9,500 for one machine shop. Multiply this cost by the number of totes used per year — in this case, 13 — and coolant alone is costing the shop roughly \$123,500 annually. Keep in mind, the machinists are using a richer-than-necessary coolant concentration, which is a common trend among machine shops.

Using a systematized approach, FullShop™ optimizes each machine's top-off ratio. In this example, the system reduces the coolant concentration from 3 to 1.5 percent, all while keeping these values within the correct range over the course of each machine's operation. The result: the machine shop saves over \$49,000 annually compared to its ad-hoc manual tending.

WHAT WOULD THIS CONTROL MEAN TO YOUR BUSINESS??



↓ **AVOID** ↓

SKIN ISSUES STAIN PARTS BREAK TOOLS
PH ISSUES FOAMING CORROSION
FOOLISH WASTE OF COOLANT TOOL WEAR ACCELERATED
SHORTENED SUMP LIFE BACTERIA ISSUES

Unlock Hidden Opportunity Costs While Maximizing Your Labor

While it's true you can calculate ROI based on all the topics covered so far in this paper, there's also a hidden opportunity cost associated with taking workers away from more productive activities each time they need to dump coolant into the sump. And these interrupted minutes per sump per shift add up.



Automation is not a replacement or an alternative for people. The case for automation really has more to do with augmenting, expanding and amplifying what those high-value people can do. We say this because the people in manufacturing who are typically the most difficult to find are the high-skill, high-knowledge manufacturing employees, and automation can't take the place of what they do. There's no way to automate the kind of value they bring to the process. We advocate that you find every repetitive task these individuals do and find ways to automate them. This will enable your employees to take on higher-value work — of which there's always plenty to do.

The good news is you can virtually eliminate these interrupted minutes with automatic coolant refill systems. By automatically delivering top-off coolant to your machine tools, these systems free up your skilled CNC machinists, enabling them to focus on their craft without serving on the usual bucket brigade. At the same time, you can unlock even greater opportunity costs by regaining the minutes lost to manual coolant delivery each shift. And, by placing your workers in jobs that produce greater value, you can unlock even greater productivity levels.



To learn more about how automatic coolant refill systems like the FullShop™ Automated Coolant Management System can improve your ROI, please visit 168mfg.com.