



Technology

4 Tips to Optimize Machine Fluid Maintenance and Coolant Disposal

Kip Hanson | Jan 30, 2018

The maintenance, disposal and recycling of metalworking fluids should be a top priority for any shop concerned about cost and productivity.

Metalworking *fluids and coolants* are an essential part of metal cutting. They also have a cost. There's the initial cost of the neat oil or water-soluble concentrate to consider. Then there are the labor costs and machine downtime that come with *sump maintenance*, a task that means chips and gunk all over the floor while the tank is periodically emptied and cleaned, followed by the seemingly endless mixing, lugging and pouring of heavy, fluid-filled buckets.

Afterward come the routine top-offs with more mess and some hassle as fluid levels slowly fall. Six months to a year later, the tired muck in the bottom of the machine is carted away and the cycle begins again.

Fluid management is time-consuming maintenance work, and it can be wasteful. The good news is there are ways to mitigate this waste while maximizing cutting fluid effectiveness.

Help Machines Stay Dry and Maximize Scrap Values with a Chip Conveyor or Chip Spinner

You can start by installing a chip conveyor. These lift chips out of the machine tool and give cutting fluid time to run back into the sump. Not only does this reduce the amount of fluid lost every day, but the relatively dry chips also return a higher price from the scrap dealer. And it's much easier—and safer—for the operator.

For metals such as brass, nickel alloys and even aluminum, wringing or spinning the chips recovers additional fluid while maximizing scrap values. Once dry, some shops even compact waste metal into briquettes or pucks.

These mechanical devices may seem like overkill, especially to smaller shops with a handful of machines, but chip spinning is an important aspect of any cutting fluid maintenance program, while briquetting is almost a necessity for high-volume manufacturers.

How to Recycle Metalworking Fluids

Even with the best maintenance procedures, no metalworking fluid lasts forever. What comes next depends on your state and municipal rules. Some areas allow relatively small amounts of filtered, pH-adjusted fluids to be poured down the drain, but these are increasingly in the minority, for good reason.

Others allow shops to evaporate water from spent fluids (in these cases, air permits are usually required) and send the oily sludge that remains to a recycling facility. If this is not feasible, the only option is to pay a recycling company to haul it away.

Neat oils and hydraulic fluids are another matter. A consumer cannot dispose of these; they must be sent to a recycler, where they are usually burned at extremely high temperatures.

There are some good reasons to maintain metalworking fluids. Doing so greatly extends their working life, reduces costs and helps to keep our planet a healthy place to live.

Keep Your Machine Fluids Clean

Reducing coolant use is important, but a second and equally important leg of the cutting fluid maintenance stool is cleanliness. Neat oils are somewhat easier in this respect—as long as small, fine particles are filtered out, most require no further maintenance. Not so with water-soluble and synthetic fluids, which are continuously bombarded by tramp oil and other contaminants.

For the cost of a decent CAT40 *end mill holder*, a belt or tube skimmer will remove most of the tramp oil and dirt that collects in all machine tool sumps. An aerator will further discourage the anaerobic bacteria that feeds on whatever tramp oil is left, as will prudent application of biocides together with maintenance of the proper pH level (always check with your cutting fluid supplier for maintenance recommendations).

Of course, this requires that cutting fluids be checked regularly (as in weekly). Hardness, chloride levels and pH should be monitored with test strips or an electronic meter. And fluid concentrations can be measured with a *refractometer*, with proportionately mixed makeup fluids added to compensate for any discrepancy. Doing these things extends tool life, increases productivity and improves operator morale. Nobody likes a stinky sump.

Use Drum Mixers to Control Machine Fluid Amounts

Speaking of makeup fluids, are you still manually mixing them? Bad idea. *Drum mixers* are available that eliminate the need for measuring cups and guesswork when preparing new or added amounts of coolant. What's more, these devices produce the correct droplet size and disperse those droplets evenly throughout the fluid. Simply set the dial to the desired concentration and turn on the faucet.

When it is time to change the sump, add some *cleaner* to the tank a day or two before. This will help break loose the crud that collects along the sides and bottom of the tank, as well as the sticky stuff on

the interior walls of the machine tool.

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Invest in a Sump Cleaning Machine

There is still a lot of backbreaking work when the sump does have to be cleaned. The good news is that there's another ***coolant management device*** that is an excellent investment. Whether you call it a SumpDoc, a Sump Sucker or a SmartSkim, these machines make fluid maintenance about as difficult as vacuuming the living room rug—just wheel it over, plug it in and start sucking.

Some are little more than big dual-tank “wet vacs”—used cutting fluid is sucked into one side and wheeled away to a separate, in-house filtration center (another viable consideration for easy fluid maintenance), while the other side contains clean fluid for refilling the sump.

Other machines are all-in-one units. Fines, sludge and tramp oil are drawn in one end, the coolant is cleaned, analyzed and adjusted, and machine-ready fluid emerges from the other. Each has pros and cons, but there's no mess in either case, and it's easy enough that sump cleaning is no longer something to be avoided. The result is that high-quality cutting fluid is available all of the time, with little to no waste.

How is your shop reducing fluid waste and performing fluid maintenance? Share your best practices.

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