New Accessory for Cleaning the Inside of the Machine Tool Cavity
Lloyd Jay Lazarus

The best way to extend the life of a metalworking fluid (MWF) is to make sure the machine tool and MWF delivery system are properly cleaned at least once per year. The dilemma the MWF manager is faced with is: How does one clean the machine tool and the MWF system on a large machine tool with an enclosure in a timely manner without impacting production schedules?

Remember the walls and roof of the machine enclosure are coated with a film of dried contaminated MWF that must also be removed. If not removed, the deposits on these surfaces can recontaminate the fresh charge of MWF. Recently, I have found a product that with this revised procedure helps to shorten the machine tool down time involved with machine cleaning.

First discuss with your MWF supplier if they have a machine cleaning product that can be used with your current water based MWF during normal machining operations. Most MWF manufacturers have a machine cleaner that can be used at a lower concentration (1 to 2% vs. 5%) and can be used while still making production parts for a short periods of time (usually 24 to 48 hours).

Second, make sure this machine cleaner is compatible with the work-piece material you are machining into product. Most cleaners are compatible with ferrous alloys. Because of the increased alkalinity of the fluid you might experience staining if you are machining copper or aluminum alloys.

Third, remove the chips from the chips pans and fluid channels. Why clean the chips you are going to recycle or haul away.

Fourth, during off shift hours circulate the MWF using a new product marketed by Rego-Fix called a “Hydroball “(Photo 1). This device has a 5/8 inch diameter straight shank which allows it to be installed in any collet or solid quick change tool holder. It has multiple nozzles so that the user can control the spray pattern generated when the MWF is circulated. It allows the user to utilize the high pressure, through spindle MWF delivery capability of your machine tool for cleaning purposes. The high pressure MWF system can now be effectively used for cleaning purposes. This will also work with standard pressure system but you must reduce the number of nozzles utilized.

By combining the movement of the machine axis around the operating envelope and the MWF circulation you can do a reasonably effective job of washing the inside of the machine tool operating cavity. Way covers will be moved and surfaces exposed because of axis movement. Spray direction will change to better wash fixtures and machine tool components. Deposits will start to breakdown and be washed into the machine tool sump. Since the cycle will run four or more hours it can be done with a weaker cleaning solution.

The pictures (Photos 2 & 3) show how effectively the Hydroball distributes the metalworking fluid inside the machine tool cavity. The distributor states that the unit can be rotated up to 50
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RPM. When running it has the same effect as the washing rotor inside of your home dishwasher.

Photo 1, Hydroball available from Rego-Fix

Inside the cavity on a machining center there is a lot of splash. During normal operations, MWF deposits buildup on the walls and roof of the enclosures. If these deposits (containing bacteria, mold and other contaminants) are not removed they will inoculate the fresh charge of MWF when they are resaturated. When you clean the inside of machine tool cavity, time is
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spent removing these deposits on the walls and roof of the enclosure. Getting to these surfaces is very difficult usually requiring that a member of the cleaning crew get inside the machine tool to reach them. The Hydro ball is effective in distributing the cleaning solution on all surfaces of the enclosure under high pressure. The only negative we have found is you get to find all the gaps and leaks in your machine tool enclosure.

By running the hydro ball with the machine cleaner enriched MWF during off shift (4 to 8 hours) you can effectively remove these deposits and buildups on the internal surfaces of the cavity of the machine tool and wash them down into the sump. You also clean the internal components of the MWF system without interrupting normal scheduled work.

Fifth, pump out the spent MWF. You will have found that most of the deposits have been washed from the internal surfaces of the enclosure. For extremely dirty machines you might have to refill the machine tool with the normal machine cleaner mix. You will find that even heavy deposits will break down quicker because of this pre-wash cycle.

Sixth, rinse the machine cavity.

Seventh, clean the walls, bottom and screens in the MWF reservoir. You will find that the use of this tool and the dilute machine cleaner reduced the cleaning time considerably without effecting production schedules.

Eighth, refill with MWF and resume normal operations.

What we like about this system is we can schedule these light cleanings just before a scheduled fluid change. We add the cleaner to the mix and run the Hydroball on second shift. The spent fluid is pumped out on third shift and the machine refilled. The machine tool with a fresh charge of MWF is ready for first shift without interrupting production schedules. We get better life from our MWFs and the machinists are happier about the condition of their machines.