Machine Shop Checklist #3: Tapping Fluids and Halogen Contamination of Metalworking Fluids

DEPARTMENT OF ECOLOGY
State of Washington

Avoid halogen contamination of metalworking fluids

Halogenated organic compounds (HOCs) can turn your spent metalworking fluid (MWF) into dangerous waste. HOCs are chemicals that have chloride, bromide, or fluoride attached to a carbon atom. Check your products for chemical names containing ***chlori***, ***chloro***, ***fluori***, or ***fluoro***.

- **Tapping fluids** can range from zero to 100 percent HOCs (with 80 percent not uncommon). These fluids include chlorinated paraffins; 1,1,1-trichloroethane; and many others. A small volume of 80 percent HOC tapping fluid can turn a large volume of MWF into dangerous waste.
- **Cleaning solvents and aerosol cans** may also contain HOCs and can turn your MWF into dangerous waste.

Any type of MWF could become dangerous waste with HOC contamination.

- **Not Used Oil** – Spent MWF that cannot be managed as used oil will become dangerous waste if the HOC concentration in the spent MWF exceeds 100 parts per million (ppm). All it takes is one squirt of 80 percent HOC (800,000 ppm) tapping fluid to contaminate the MWF.
- **Used Oil with over 1,000 ppm HOC** – Spent MWF that can be managed as used oil is presumed to be mixed with dangerous waste if HOCs exceed 1,000 ppm. It must be managed as dangerous waste, unless you can prove that it is not dangerous waste (not recommended—see below).
- **Used Oil with over 10,000 ppm HOC** – This designates as a Washington State extremely hazardous persistent waste (WP01) and must be managed as dangerous waste.

Eliminate HOCs to keep MWF from becoming dangerous waste

Reduce dangerous waste by keeping HOCs out of your MWFs and out of your machine shop.

- Make sure your fresh MWF does not contain HOCs.
- Switch to non-halogenated tapping fluids.
- Switch to non-halogenated cleaning solvents.
- Switch to non-halogenated aerosol spray cans.

Look at the safety data sheets of your tapping fluids, solvents, and MWFs. Do the ingredients add up to 100 percent? Most safety data sheets do not list all ingredients, especially MWFs. The only way to be sure is to contact the manufacturer and ask if the product contains any chlorinated, fluorinated, or brominated compounds.

After you remove HOCs from your shop, use new waste containers or thoroughly clean your old ones before you retest your MWF for HOCs.

Test for HOCs

A Chlor-de-Tect test kit or total halogens test can tell you if the HOC concentration of your shop's fluid is greater than 1,000 ppm.

Publication 25-04-053 | October 2025

If you have an outside laboratory test for total HOCs, the following methods are commonly used:

- EPA method SW-846 3050.
- Sample preparation method 9056.

Be sure to specify a lower detection test limit below 100 ppm and an upper limit above 10,000 ppm.

Other options (not recommended)

1. Proving a used oil isn't dangerous waste is expensive

If the disposal status of your unused MWF is "used oil," but the spent fluid exceeds 1,000 ppm HOCs, you have two choices: (1) Manage it as dangerous waste (recommended), or (2) Rebut the presumption the spent MWF has been mixed with dangerous waste.

Federal regulations require significant testing to prove that a MWF does not contain hazardous waste:

> ***"Rebuttable presumption for used oil.*** If the used oil contains greater than or equal to 1,000 ppm total halogens, it is presumed to be a hazardous waste because it has been mixed with halogenated hazardous waste listed in subpart D of part 261 of this chapter. The owner or operator may rebut the presumption by demonstrating that the used oil does not contain hazardous waste (for example, by showing that the used oil does not contain significant concentrations of halogenated hazardous constituents listed in appendix VIII of part 261 of this chapter)."[1]

There are many hazardous constituents listed in Appendix VIII to 40 CFR 261.[2] Testing for all would be very expensive. If your waste has layers, each layer must be tested separately. It would be less expensive to:

1) Dispose of your problematic spent MWF as dangerous waste.
2) Eliminate the sources of HOCs from your shop.
3) Retest the spent MWF for total halogens only.

2. Closed-loop recycling isn't practical

Metalworking fluid subject to closed-loop recycling is exempt from waste designation. In closed-loop recycling, you would send your spent MWF off to be re-refined, and it would be sent back to you for reuse as MWF under a formal agreement between your machine shop and a MWF recycler. But to date, this has not been cost-effective in Washington State.

Contact Information

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ADA Accessibility

To request an ADA accommodation, email HWTRPubs@ecy.wa.gov, call (360) 407-6700, or dial 711 for relay services. Visit ecology.wa.gov/ADA for more information.

[1] 40 CFR 279.53(c): https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-279/subpart-F/section-279.53.
[2] https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-261#Appendix-VIII-to-Part-261