

This guidance document is advisory in nature but is binding on an agency until amended by such agency. A guidance document does not include internal procedural documents that only affect the internal operations of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules and regulations made in accordance with the Administrative Procedure Act. If you believe that this guidance document imposes additional requirements or penalties on regulated parties, you may request a review of the document.

05-183

revised January, 2023

Parts Washers General Information on Providers

Overview

Parts washers are used to clean dirt, oils, greases and other wastes off of mechanical parts. Vehicle repair shops, all types of industry, and the military commonly use them for the repair and maintenance of machines and machine parts. Parts cleaners vary in complexity from a simple sink on a barrel to the more complex automatic spray cabinets. This document is not meant to include all technologies. It is meant to provide a sampling of alternative parts cleaning and a means for you to research cost and suitability. Our hope is to help you reduce wastes, stay in regulatory compliance and improve your bottom line.

Solvents

Parts washers use a wide range of solvents in the cleaning process by dissolving dirt and grime off of the part. The type of contaminants, parts material, and cleaning process determines what kinds of solvents to use. Common solvents are organic compounds such as N-methylpyrrolidone, glycol ethers, petroleum distillates, aqueous detergents, terpenes, and microbial enzymes. Some types of cleaners employ a combination of aqueous and organic solvents. For example, terpenes are commonly mixed in a semi-aqueous solution for use as a cleaner. Some halogenated organic solvents are being phased out because they are ozone-depleting substances such as 1,1,1-trichloroethane (TCA) and 1,2,2-trichloro-1,1,2-trifluoroethane (CFC-113).

Hazardous Waste

Parts washers can be a significant generator of hazardous waste due to the disposal of spent solvents. Spent parts washer solvent may be a hazardous waste for its hazardous characteristics or for containing a "listed" hazardous waste. Some characteristics that make spent or disposed parts washer solvent hazardous are:

- 1) Ignitability (Flash point below 140° F);
- 2) Corrosivity (pH below 2.0, or above 12.5);
- 3) Reactivity;
- 4) Toxicity (contains one or more of 40 different chemicals above a certain regulatory level).

Some examples of toxicity are lead, cadmium, chromium, methyl ethyl ketone (MEK), etc. (See Title 128, Chapter 3, §007 through §010, and Table 3). Metals such as chromium and cadmium can leach off of bearings and plated objects into the spent solvent. Listed hazardous wastes could be generated as the solvent itself or by mixing with certain "listed" wastes such as spent trichloroethylene (TCE)

(F002). The most common “listed” wastes could be F001 thru F005 depending on the solvent(s) used or the solvent(s) added to the parts washer (See Title 128, Chapter 3, §013 through §016 and Table 4). “Listed” hazardous waste is not determined by testing but by knowing if the solvent is or has been mixed with a listed waste.

Testing

Depending on the type of parts washer, hazardous waste that would need testing includes the spent solvent, used filters, sludge, bioremediation pads, and distillation bottoms. Testing includes determining if any characteristic hazardous waste is present by analytic means. The spent parts washer waste’s status should be confirmed by periodic testing. The interval for re-testing is not established by regulation, but should be done if processes change, parts washer practices change, or there is a change in solvents. The more variable the waste stream, the more often sampling and testing will be needed. Management’s professional judgment should be used. In-house documentation should be established to substantiate the sampling techniques used to test the parts washer wastes and to document the test results.

A note about filter use: The filter change out schedule can impact the probability of the filter being a hazardous waste. For example, a filter changed every four weeks is far more likely to be non-hazardous than one changed every six months. Actual filter usage is highly dependent on the processes involved. Lots of dirt or grease will significantly shorten filter life.

See the NDEE Environmental Guidance Document titled “Waste Determinations & Hazardous Waste Testing” located on the NDEE web site.

Multiple Parts Washers

In facilities with more than one parts washer, the processes for each parts washer should be documented. This is because the waste characteristics may vary from machine to machine. Wastes generated from different locations (different parts washers) may be considered different waste streams. If one parts washer was hazardous waste for chromium and all the others were non-hazardous, then one composite sample taken from all machines would likely dilute the hazardous waste parts washer to a point that it appeared all the parts washers generated non-hazardous waste. Generally, it is advisable to take a “grab” sample, that is, a separate sample from each parts washer, to ensure an accurate waste determination.

General Guidelines

The following guidelines are to help properly manage parts washers and their hazardous waste:

- Avoid using a solvent with a flashpoint below 140° F. By using higher flash point solvents, the spent solvent will not normally be a D001 ignitable hazardous waste in its own right.
- Avoid using a solvent that will be “F”-listed in its own right. For example, 1,1,1-trichloroethane (TCA) (F001 or F002) or trichloroethylene (TCE) (F001 or F002).
- If you use a solvent service, consider the longest service interval consistent with your needs. Also, stagger the servicing months to minimize the amount of waste being generated in any one month.
- Consider using separate parts washers in stages. Use one sink for dirty parts and a second sink for the final cleaning. Overall, this technique extends solvent life.

- Do not allow any other solvents to be used in or over the parts washer. A common source of contamination is the use of spray solvents such as brake cleaner or carb cleaner containing tetrachloroethylene or other “F”-listed hazardous waste over the parts washer basin.
- Do not allow any external sources of contamination in any parts washer. In other words, don’t let any non-business related parts or items be cleaned in your parts washer. This policy keeps the parts washer solvent from being unnecessarily contaminated with toxicity characteristic (TC) or *listed* hazardous waste. *Listed* waste could normally be generated from putting **any** amount of certain spent solvents that are F-listed into the parts washer. (See Title 128, Chapter 3, § 013, Table 4, Waste Codes F001 – F005.)
- Pre-wipe parts to remove excess grease or oil. This extends the life of parts washer solvent and, if installed, the filter service life. Reusable shop towels are recommended for pre-wiping. (See NDEE Fact Sheet on Solvent Contaminated Shop Towels, Rags, and Wipers)
- Change filters and pads, if installed, frequently enough to prevent fouling. This will also reduce your chances of the filters and pads failing for the toxicity characteristics of hazardous waste.
- Clean out sludges often from aqueous parts washers.
- Do not empty spent aqueous parts washer wastewater into a septic system. Never drain spent organic solvents to any sanitary sewer.
- Check for any pretreatment requirements if you drain spent aqueous parts washer wastewater to a sanitary sewer connected to a publicly owned treatment works (wastewater treatment plant).

Suppliers

Parts washer replacement does not have to be an “all-or-nothing” exercise. Many vendors will set up a demonstration machine for a set period – usually 30 days. Most reputable vendors will recommend the demonstration machine be placed in an area that is easily accessible and that it gets the worst kind of cleaning processes your company can supply. Note: Nebraska Department of Environment and Energy does not verify or endorse any private business or entity. You should perform a web-search for the type of service you require to find what is available in your area. Examples of some solvent types and their descriptions are provided below.

Solvent Supply Service

Solvent Supply Service companies will pick up the spent solvent and replace it with new solvent as needed on a regular basis. If you use a solvent supply service, you must determine your actual hazardous waste codes. Waste determinations that are provided by the service are not an adequate determination of your solvent waste unless the determination is based solely on your solvent waste. Hazardous waste determinations are based on the waste, as generated, at the waste generator site, not samples of the universe of spent solvents managed by the service provider.

Batch Cleaning Equipment

Batch parts washers clean a quantity of parts in one run. They use a variety of solvents. The most common types of batch cleaning equipment are immersion tanks and spray cabinets. Agitators, oscillators, sprayers and ultrasonics are some methods used to enhance cleaning agitation. These automatic washers allow technicians to perform other duties while the parts are being cleaned.

Aqueous/Semi-aqueous Cleaning Equipment

Aqueous and semi-aqueous parts washer systems use detergents or terpene/citrus based solvents with water rather than straight organic solvents. "Flash rusting" is a consideration that can usually be controlled with inhibitors or process management. Aqueous, automatic parts washers can reduce organic solvent use and increase worker productivity. Many of these types of machines are spray cabinets.

Ultrasonic Cleaning Equipment

Ultrasonic parts washers create millions of tiny bubbles via a transducer. The bubbles expand and collapse to produce a scrubbing action on the part. This works well on parts with blind holes and spots.

Filtration Recycling/Treatment Systems

Filtration parts cleaners filter the solvent to being reused. They avoid solvent replacement and reduce hazardous waste. Many vendors require the use of proprietary solvents and filters for warranty purposes. Filtration machines typically use two types of filters in stages to keep the solvent clean. In most applications, the solvent can go several years, or even indefinitely, before the solvent is actually "spent." Some replacement solvent is required periodically to account for losses due to drag-out and evaporation.

Bioremediation Systems

Bioremediation systems employ a pad to filter the solvent and deploy enzymes and microbes that "eat" the oils and greases in the solvent. These types of machines typically heat the solvent to approximately 105° F to enhance the microbial action and help the solvent to dissolve the soils. Bioremediation systems normally employ aqueous type solvents.

Solvent Distillation Recovery Systems

Solvent distillation units distill the organic solvent and return clean solvent to the parts basin. The distillation bottoms from this process may need to be managed as hazardous waste. The advantage is that this is only a fraction of the amount of hazardous waste usually generated by parts washers.

Spent Solvent Reuse

This system uses the spent parts washer organic solvent "as is" as an actual product. This allows the users of the parts washer solvent to ship the solvent out as a product rather than a hazardous waste (Title 128, Chapter 2, §003.05A1). Users of this system must have management practices in place to prevent the introduction of "F" listed type solvent waste into their parts washers.

RESOURCES:

- NDEE Home Page <http://dee.ne.gov/>
- MSDS information – <http://www.ilpi.com/msds/>
(NDEE does not endorse any public or private website.)

Contacts:

- NDEE Toll Free Number (877) 253-2603
- NDEE Hazardous Waste Compliance Assistant (402) 471-8308
- Email questions to: NDEE.moreinfo@nebraska.gov

NDEE Publications:

- [Title 128 – Nebraska Hazardous Waste Regulations](#)
- [Title 132 – Integrated Solid Waste Management Regulations](#)
Titles are available on the NDEE Home Page under “Laws/Regs & EQC”, “Rules & Regulations”

Produced by: Nebraska Department of Environment and Energy, P.O. Box 98922, Lincoln, NE 68509-8922; phone (402) 471-2186. To view this, and other information related to our agency, visit our web site at <http://dee.ne.gov>.