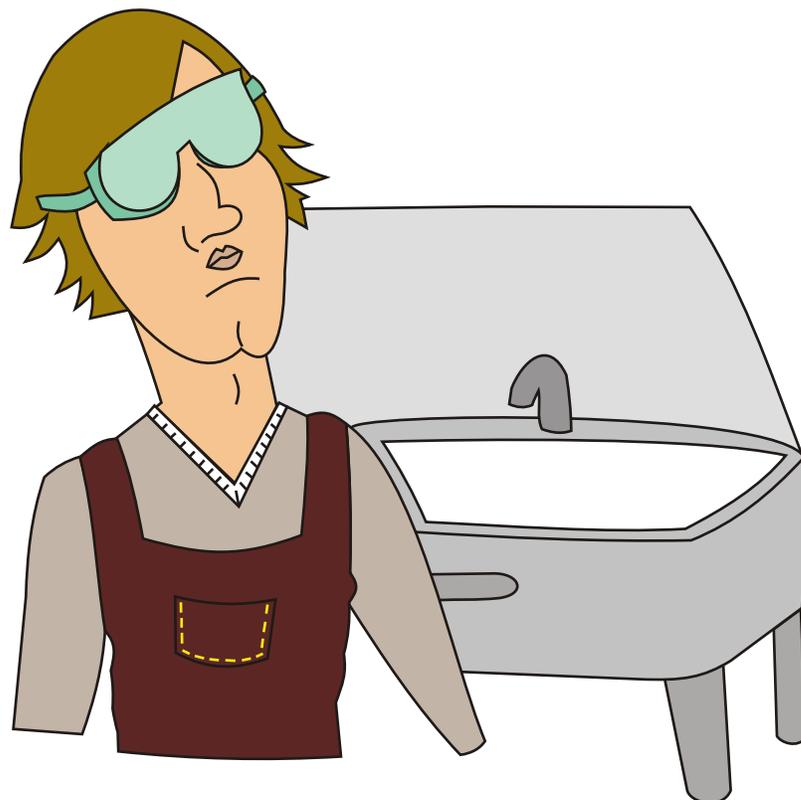


OHIO EPA'S PARTS WASHER HANDBOOK

THIS HANDBOOK WILL HELP YOU:

- 1) COMPLY WITH THE REGULATIONS
- 2) \$AVE MONEY
- 3) REDUCE THE HAZARDOUS WASTE YOU GENERATE



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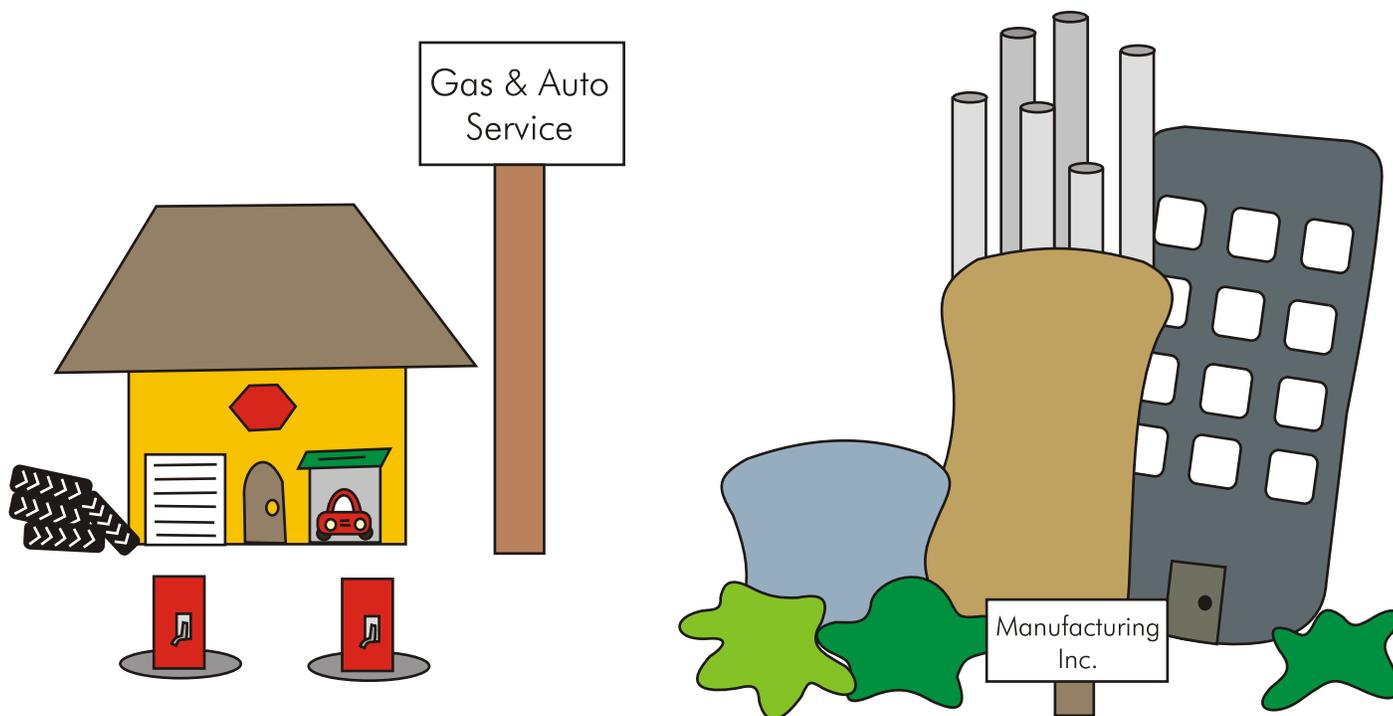


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DOES YOUR BUSINESS USE A STAND-ALONE SOLVENT-BASED PARTS WASHER?



Businesses using these units range from small auto service stations to large industrial facilities. Dirty parts are rinsed in the unit with a solvent while the operator brushes oil, soil or grease from the part. The unit consists of a cleaning basin, solvent reservoir and recirculating system. Capacity ranges from three to 45 gallons of solvent. Solvents used include petroleum-based solvents like mineral spirits, stoddard, petroleum naphtha and organic solvents like trichloroethane, trichlorethylene, benzene and xylenes.

HOW CAN YOU SAVE MONEY AND REDUCE THE AMOUNT OF HAZARDOUS WASTE GENERATED FROM SOLVENT-BASED PARTS WASHERS?

- 1) Increase the life of the solvent.** You can do this by pre-cleaning the part, increasing the time between solvent change outs, filtering, or distilling spent solvent.
- 2) Evaluate switching to a solvent with a higher flash point.** There are many alternative solvents available with flash points above 140° F, which may allow you to manage and dispose of your waste solvent as a non-hazardous waste.
- 3) Consider switching to a hot water or a bio-remediating parts washer.** A bio-remediating parts washer contains specially developed microbes that eat the oil and grease that is removed by the heated water-based detergent/microbe solution.

1. INCREASE THE LIFE OF YOUR SOLVENT BY:

A. PRE-CLEANING THE PART.

This prevents some of the bulk "dirt" from getting into the parts washer. Before placing the dirty part in the cleaning basin, pre-clean it with a wire brush, squeegee or scraper. Or, use a two-stage cleaning system, designate one parts washer with the dirtiest solvent for the initial cleaning. Then, follow-up with the "cleaner" solvent parts washer for the final cleaning.

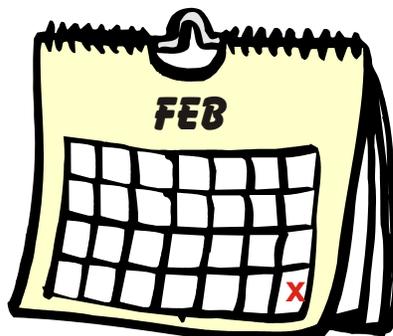


B. INCREASING THE TIME BETWEEN SOLVENT CHANGE-OUTS.

Many companies have found that extending the time period between pick-ups can be done without sacrificing cleaning quality. If you use a contract service, schedule pickups when the solvent no longer cleans your parts.



X ABC WASTE PICK-UP



X ABC WASTE PICK-UP



X ABC WASTE PICK-UP

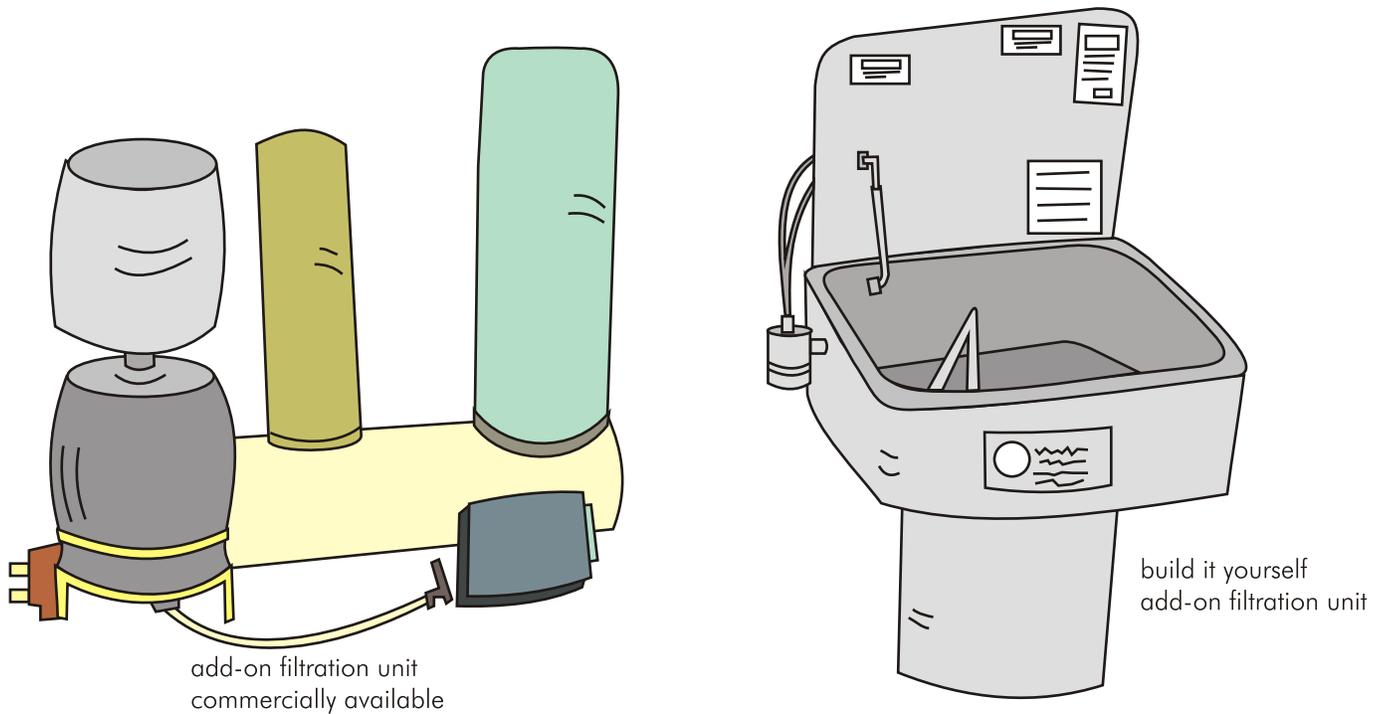
Old schedule

- pick up 2x per month

New schedule

- pick up 1x per month or as needed

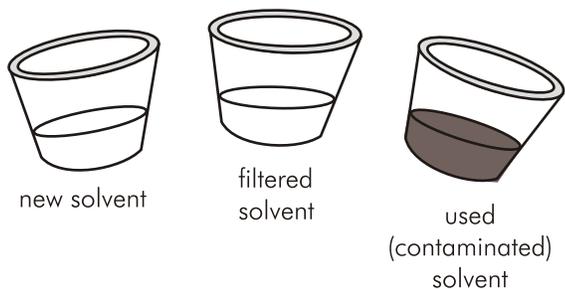
C. FILTERING THE SOLVENT.



A filtration unit can increase the life of the solvent by 350 to 600 percent and reduce the solvent waste stream by 50 to 80 percent. Filter cartridge life ranges from four to 12 weeks, depending on the specific situation. Some companies claim that solvent life can be extended more than three years by a filter. If you are in the market for a new parts washer, you may want to consider purchasing a unit with a built-in filtration unit. If you currently have a parts washer that is working fine, you can add on a commercial filtration unit or build one yourself. Many manufacturers sell add-on filter units ranging in cost from \$60 to \$150 (not including replacement filter cartridges).

The Iowa Waste Reduction Center (IWRC) publishes a eight-page brochure *“Adding a Filter to Your Parts Washer.”* This brochure has step-by-step instructions with photos on how to do this for less than \$50 using an auto/truck oil filter or a fuel filter in a few hours. The IWRC also performed tests to see if flow was restricted after adding a filter and found no measurable decrease even after considerable “gunk” had accumulated in the filter. Their brochure is available at:

www.iwrc.org/downloads/pdf/partsWasher1x1.pdf



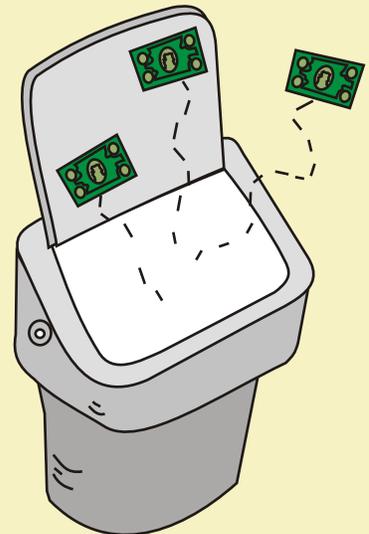
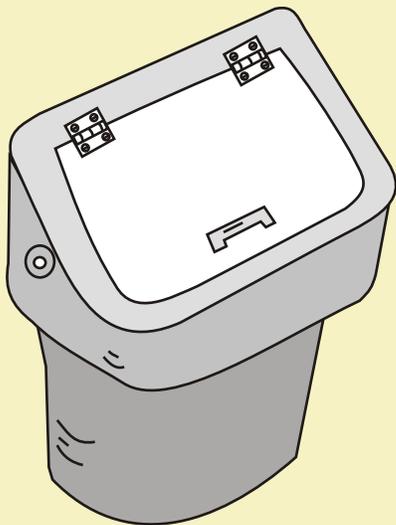
Success Story:

The Naval Air Station (NAS) Patuxent River found that using a parts washer with a filtration system extended the life of the solvent three to five years. Without the filters, the spent solvent was disposed every six to eight weeks.



TIPS TO HELP YOU MINIMIZE YOUR SOLVENT-BASED PARTS WASHER WASTE:

- ★ CLOSE THE COVER AND TURN OFF NOZZLES WHEN NOT IN USE TO PREVENT EVAPORATION.



- ★ KEEP PARTS WASHERS AWAY FROM HEAT SOURCES AND DRAFTS TO PREVENT EVAPORATION.
- ★ DRAIN ALL PARTS COMPLETELY TO REDUCE THE DRAG-OUT LOSS OF THE CLEANING FLUID. YOU MAY WANT TO INSTALL A DRAINAGE SHELF ON YOUR UNIT.
- ★ EVALUATE THE NUMBER OF PARTS WASHERS AT YOUR FACILITY. GET RID OF ONES NOT USED VERY MUCH.
- ★ MAINTAIN THE PARTS WASHER AS NEEDED.
 - CHANGE FILTER
 - MONITOR SOLVENT
 - ADD SOLVENT AS NEEDED

Compliance Tip

Used filters may be hazardous waste if they pick up toxic contaminants like lead or other heavy metals. Be sure to evaluate them properly before disposing.

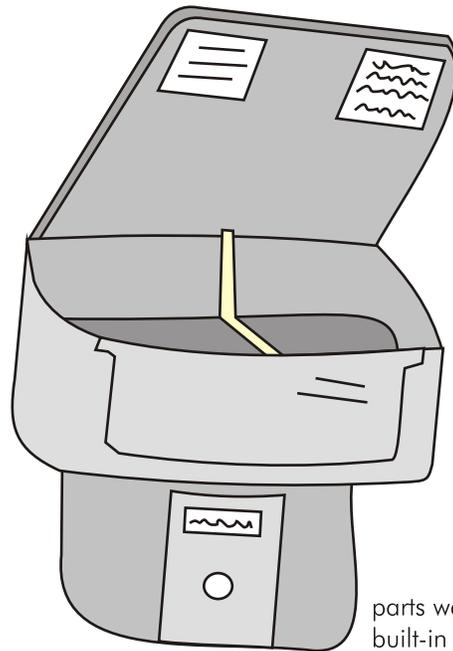


D. DISTILLING THE SPENT SOLVENT TO RE-USE

If you distill spent solvents, you can re-use the solvent over and over. You can purchase distillation units as a stand-alone unit, or some manufacturers make parts washing units with built-in distillation units.



distillation unit



parts washer with built-in distillation unit

HOW DO DISTILLATION UNITS WORK?

They heat the spent solvent to its boiling point, evaporating the solvent and condensing the solvent vapors into a separate container. The remaining contaminants called “*still bottoms*” are sometimes processed into fuel for energy recovery or disposed. Businesses can also use an outside recycler, who takes the solvent off-site to distill and returns the distilled solvent for re-use.

Success Stories:

Robin Enterprises Co., a Columbus lithographic printer, purchased a distillation unit to recycle their blanket wash. Their hazardous waste disposal was reduced by 96 percent. In 2003, they disposed of 105 55-gallon drums of hazardous waste and now they estimate disposal of four 55-gallon drums of still bottoms per year. They save approximately \$13,000 in raw material cost and \$21,000 per year in hazardous waste disposal.



Total Image Specialists, a retail marketing company in Columbus that designs and manufactures indoor and outdoor signs, purchased a combination spray gun washer/distillation unit. Before, they manually cleaned gummed-up guns, which often took hours. The new washer unit cleans guns in just a few minutes. They save 50 percent in waste management costs and have increased productivity by 30 percent. They used to spend \$18,000 to dispose of and purchase new thinner and spill-control supplies. Now they spend \$9,000 on leasing the unit, new solvent, disposal of the still bottoms and supplies. They used to dispose of four to five 55-gallon drums of liquid hazardous waste every month, but now they now dispose of one 30-gallon drum of solid hazardous waste per month.

COMPLIANCE TIPS FOR ON-SITE DISTILLATION UNITS



Hazardous spent solvent is subject to regulation prior to distillation.

You need to comply with the hazardous waste rules if you accumulate spent solvent prior to the distillation process (labeling, storage, inspections, training etc.)



The distillation process itself is exempt from regulation as a hazardous waste treatment process.

You will not need a hazardous waste treatment permit if you recycle spent solvent at your site.



Still bottoms generated from distillation units are generally hazardous wastes.

If your spent solvent is a *listed hazardous waste*, then your still bottoms would also carry the same listing. They may also exhibit characteristics of hazardous waste (ignitability and/or toxicity).



The reclaimed solvent resulting from on-site recycling is considered product as long as it is used for its intended purpose (cleaning).



As a generator you should count the spent solvent only the first time it is generated each calendar month,

since generator status is determined on a month-to-month basis. *



Still bottoms should not be counted the first time they are generated in a calendar month,

because they are considered to be counted with the spent solvent as it is counted the first time each month. Since the spent solvent is not counted when used more than once during that month, the still bottoms must be counted after the first time generated that month. *



You may be subject to the *Land Disposal Restrictions (LDR)* regulations.

If you are an *SQG* or *LQG*, you are subject to LDRs and you will need to complete a one-time notice to keep on file at your facility. This should include information on how the waste solvent was generated, and how it is recycled and re-used. Information on why the waste solvent is excluded from the definition of hazardous waste or waste, or exempted from regulation as a hazardous waste should be included. This notice shows that the spent solvent was not illegally land disposed.



If your parts washer has a built-in distillation unit (that is, closed-loop), you will only need to count the still bottoms/sludge toward your monthly generation rate.



You should contact Ohio EPA's Division of Air Pollution Control to see if you need a permit for your distillation unit before installation.

* For additional information on counting spent solvent and still bottoms to determine generator status see the following DHWM Notifier newsletter articles:

BEFORE YOU BUY A UNIT OR CONTRACT WITH AN OFF-SITE SERVICE...

...you should evaluate if the spent solvents you generate can cost-effectively be recycled by distillation. Some issues to consider are:

1) Is distillation the right technology? Distillation easily separates similar liquids. If solid particles are the main contaminant, filtration may be the right technology.

2) Can the distilled solvent be used again for the same process? If not, is there another process in which the solvent can be used? If your business uses a blended solvent, and the solvents have a wide range of *boiling points*, distillation will produce a solvent different from the original blend.

3) What is the percentage of solids or other contaminants in your waste? Some distillation unit manufacturers claim a high solvent recovery percentage (90 to 95 percent). If your waste is not mostly solvents, this method may not be cost-effective for you.

4) Do you currently mix different types of waste solvent? If you do, simple batch distillation will produce a mixed solvent product that you may not be able to use. You may need to keep the different waste solvents separate before distilling.

5) Do you use a solvent with a very high boiling point? If so, a vacuum distillation unit may be required due to safety (fire and explosion) concerns. Vacuum distillation can add to the purchase price and operating costs.

Vendors of distillation units can help you determine if an on-site distillation unit will work for you. Most vendors are willing to recycle a sample of your waste solvent to demonstrate that the process is effective and to help determine if the recycled solvent will work for you. The cost of a small solvent distillation unit generally starts at around \$2,000.

The *Winter 2003 and Spring 2004 Notifier* editions contain detailed articles on the solvent distillation process, regulatory considerations and vendor information at:

www.epa.state.oh.us/dhwm/newsletter.html

The Iowa Waste Reduction Center (IWRC) has developed a solvent distillation unit calculator on its Web site. The calculator uses your estimated gallons of solvent used per year to calculate a *payback* for the purchase of a unit. The IWRC calculator can be found at:

www.iwrc.org/SBPPC/costCalcs/solvent.cfm



Safety Tip

Explosion or fire hazard conditions can be created when some materials are distilled. Be aware:

- Safety regulations must be met when installing and operating a solvent distillation unit;
- OSHA has requirements for ventilation and employee safety; and
- Local fire regulations must be followed.

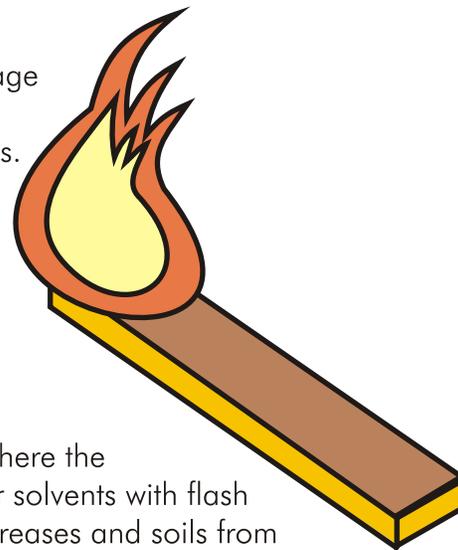


2. EVALUATE SWITCHING TO A SOLVENT WITH A HIGHER FLASHPOINT >140° F

If you use a solvent with a higher *flash point* you may be able to manage your spent solvent as non-hazardous waste. This can reduce your environmental liability, regulatory paperwork and training requirements. However, be aware disposal costs may be similar to hazardous waste disposal costs because the spent solvent will be handled through a waste service for recycling, fuel blending or incineration.

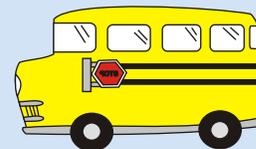
NOTE: Switching to a higher flashpoint solvent may reduce your *hazardous waste* generated, not the amount of *waste* generated.

Many solvents are hazardous due to the *characteristic* of ignitability, where the solvent has a flash point less than 140° F. There are suppliers that offer solvents with flash points above 140° F. Solvents with higher flash points can clean oils, greases and soils from various types of metals. You can ask your current solvent supplier if they sell some of the higher flash point solvents that you might try on a trial basis. There are some vendor databases to locate companies offering these products. University of Minnesota's Technical Assistance Program (MnTAP) has a vendor list at: mntap.umn.edu/resources/Checklist.htm. The Iowa Waste Reduction Center (IWRC) has a searchable vendor database at: <http://www.iwrc.org/NewVendor/>. Ohio EPA's Office of Compliance Assistance and Pollution Prevention (OCAPP) maintains a searchable list of Recyclers and Environmental Service Providers at: www.epa.state.oh.us/ocapp/recycle.html



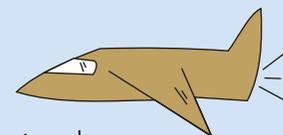
Success Story:

A school district transportation center in Colorado with 30 employees switched from a stoddard-based solvent with a flash point of 105° F to a straight chain aliphatic hydrocarbon solvent with a flash point of 143° F. The solvent is filtered to extend its life one to two years. The payback for switching was about three years with a reduced cost of about \$250 per year. Benefits included reduced hazardous waste generation and associated liabilities, as well as a more positive business image.



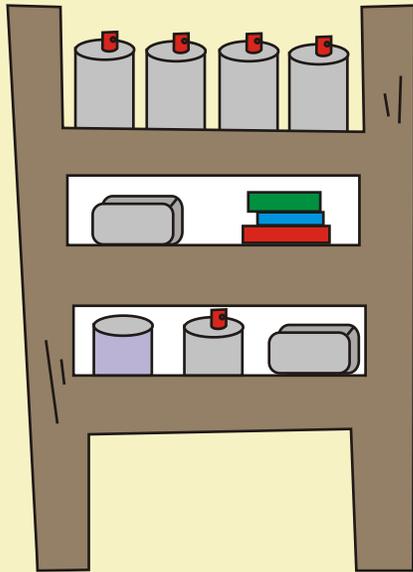
Success Story:

The U.S. Air Force Academy switched to a mixture of a straight chain aliphatic hydrocarbon solvent with a flashpoint of about 150° F, with a filtration system. Previously, their 20 parts washers had been changed out every six to 12 weeks and averaged 24,000 pounds of hazardous spent solvents per year. Over a six-year period, after changing to a high flash solvent, they generated 1,840 pounds of spent filters and spent solvent, compared to 144,000 pounds using old solvent.



TIPS TO MAINTAIN HIGH FLASHPOINT SOLVENT AS NON-HAZARDOUS:

- ★ DON'T USE CHLORINATED AEROSOLS LIKE BRAKE, CARBURETOR CLEANER OR ENGINE CLEANER OVER THE PARTS WASHER.



Adding any amount of **RCRA** F-listed solvent like methylene chloride, 1,1,1-trichloroethane, trichlorethylene, or a non-halogenated solvent (methyl ethyl ketone, toluene or benzene) can make the entire batch of waste solvent hazardous according to the **mixture rule**, requiring management as a hazardous waste.



- ★ DON'T CONTAMINATE NON-HAZARDOUS SOLVENT WITH LOW-FLASHPOINT (LESS THAN 140° F) SUBSTANCES.

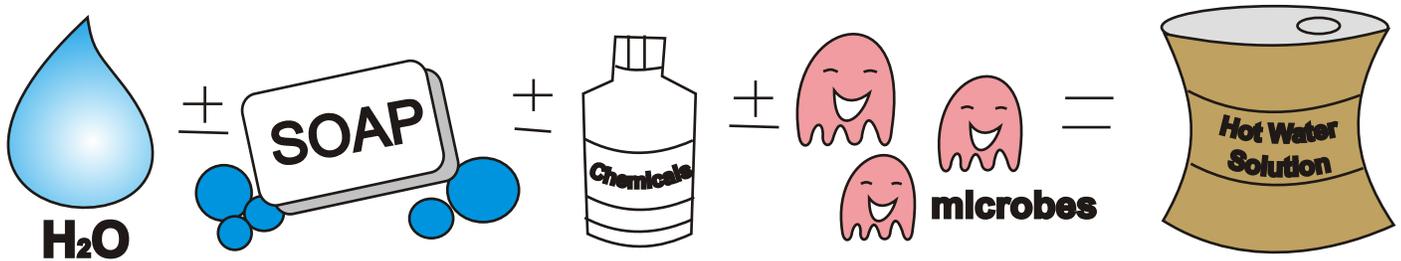


IF ENOUGH OF THESE ARE ADDED, IT CAN LOWER THE FLASHPOINT OF THE ENTIRE BATCH.

3. CONSIDER SWITCHING TO A HOT WATER OR A BIO-REMIEDIATING PARTS WASHER.

WHAT'S IN A HOT WATER SOLUTION?

Hot water solutions (sometimes called aqueous-based solutions) are made up of detergents, alkaline chemicals, microbes or any combination. They are nonflammable and contain little or no Volatile Organic Compounds (VOCs).



HOW DO THEY WORK?

Instead of dissolving grease or solids, they use heat, agitation, soap action and time to break up the dirt into smaller particles. The part you are cleaning must be able to be immersed in water without serious “flash rusting” to use these solutions. However, some additives are available to inhibit “flash rusting.”

Enclosed tub or open basin units are available in stainless steel and have a capacity of six gallons or more. The solutions generally last longer and don't need to be changed out as frequently as solvents. Solution life span can vary depending on the use; some hot water-based brake washing or microbial based solutions can last for two to three years before changing out the spent solution. Life span of the solution can be extended by oil skimming and filtration.

Routine maintenance required on hot water units includes:

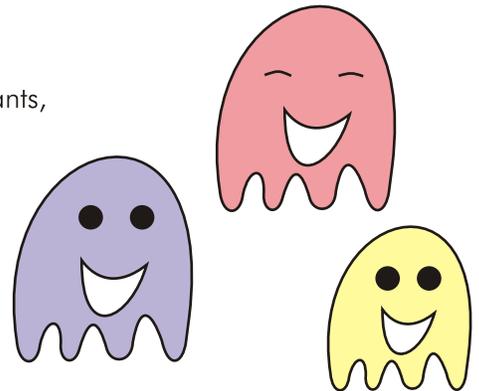
- adding water and chemicals as needed;
- skimming oil (not on microbial units); and
- replacing filters every few weeks to several months.

TYPES OF HOT WATER CLEANING UNITS *

Microbial or Bio-remediating sink-top units

Best for quick, light-duty cleaning

Used for manual cleaning of parts the same way as conventional solvent sink-top units. Microbes in the solution degrade oils and organic contaminants, extending solution life. Microbes are generally considered safe for use with minimal apparent risk to technicians. Non-microbial hot water sink-top units are also available; these usually require more frequent solution changes, which may increase operating costs relative to microbial units.



Applications

- Preventive maintenance and light-duty cleaning
- Parts with light to moderate soil buildup
- Small quantities of parts
- Parts for immediate replacement on a vehicle

Key features

- Solution heated to 110° to 120° F
- Filtering available to remove solids
- Microbes degrade oily contaminants

Advantages

- Low capital cost compared to other aqueous cleaning units
- Little or no waste solution
- Does not chap technician's hands

Disadvantages

- May require more scrubbing effort than solvent
- Difficult to clean heavy or stubborn soils
- Keeping microbes alive requires worker training

Unit Selection Considerations

- Make sure the unit is at the right height for your workers
- Greater sink-top size allows larger parts to be cleaned
- Higher pump pressure improves cleaning action
- Workers may react negatively to certain odors

Cost

\$1,000 to \$1,500

* From U.S. EPA fact sheet "Aqueous Parts Cleaning" (see list of references on page 20).

TYPES OF AQUEOUS CLEANING UNITS *

Spray cabinets

For heavily soiled or large volumes of parts

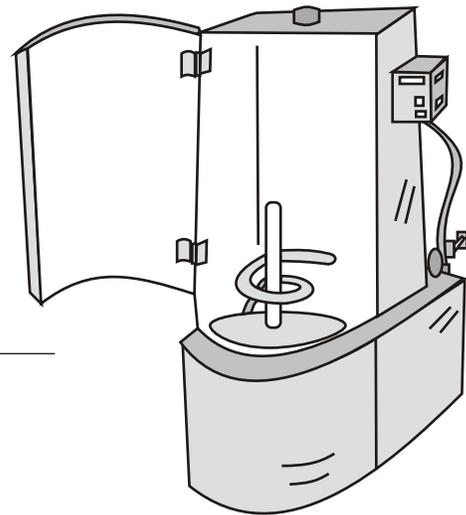
Clean parts by spraying high-temperature solution at high pressures within an enclosed cabinet. Spray cabinets are available in a full range of capacities from small to large.

Applications

- Parts with heavy or difficult to remove soils
- Moderate to very large quantities of parts
- Medium to large sized parts
- Heavy-duty repairs and rebuilding

Key features

- Solution heated to 130° to 190° F
- Spray pressures of 40 to 60 pounds per square inch
- Oil-skimming options
- Solution concentration typically maintained between 10 and 15 percent



Advantages

- Significant reduction in cleaning labor
- High level of cleaning performance
- Large cleaning capacities available
- Lower waste management costs compared to solvent units

Disadvantages

- Moderate to high initial cost (but lower operating costs due to labor savings)

Unit Selection Considerations

- Pump power, spray pressure, flow rate, and number of nozzles (higher spray pressures and greater coverage result in better cleaning performance)
- A 220-volt outlet is often required
- Temperature adjuster helps optimize cleaning performance
- Insulated units are more energy efficient

Cost

\$1,700 to \$11,500

* From U.S. EPA fact sheet "Aqueous Parts Cleaning" (see list of references on page 20).

TYPES OF AQUEOUS CLEANING UNITS *

Immersion units:

When the soak option is needed

Consist of a rectangular tank filled with aqueous solution and a removable false bottom. Immersion units give technicians the option of soaking parts in the aqueous solution below the false bottom to loosen soils on the parts or manually scrubbing parts on top of the false bottom, as performed in a sink-top unit.

Applications

- Parts with light to moderate soil buildup
- Small to moderate quantities of parts
- Light to medium-duty repairs

Key features

- Allows soaking of parts
- Solution heated to 110° to 120° F
- Filter and oil skimming options
- Solution concentration typically maintained between 25 to 30 percent

Advantages

- Soaking can improve cleaning and reduce scrubbing time

Disadvantages

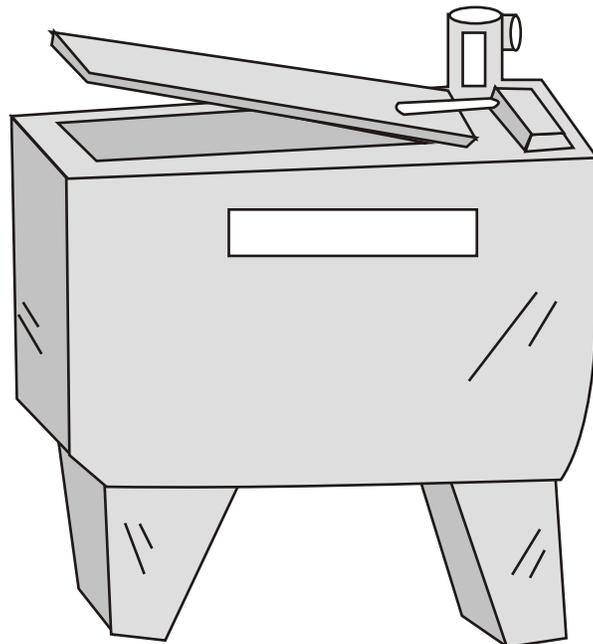
- More expensive than sink-top units
- May be difficult to clean heavy or stubborn soils

Unit Selection Considerations

- Make sure unit is at a comfortable height for your workers
- Greater size allows larger parts to be cleaned
- Workers may react negatively to certain odors
- Units available in stainless steel or plastic construction

Cost:

\$1,700 to \$3,500



* From U.S EPA fact sheet "Aqueous Parts Cleaning" (see list of references).

TYPES OF AQUEOUS CLEANING UNITS *

Ultrasonic units:

Cleans blind areas

Consist of a steel tank filled with an aqueous solution and are equipped with transducers along the bottom or sides of the tank. The transducers generate high frequency sound waves that produce an intense microscopic scrubbing action on parts surfaces, including blind holes and interior surface areas.

Applications

- Transmissions, carburetors and other hard-to clean parts
 - Parts with blind holes and hidden surface areas
 - Heavy-duty repairs and rebuilding
-

Key features

- Transducers generate ultrasonic waves
 - Solution heated to 140° to 185° F
 - Filter and oil skimming options
-

Advantages

- Very high performance cleaning
 - Ability to clean hidden areas on parts
 - Significant reductions in cleaning labor
-

Disadvantages

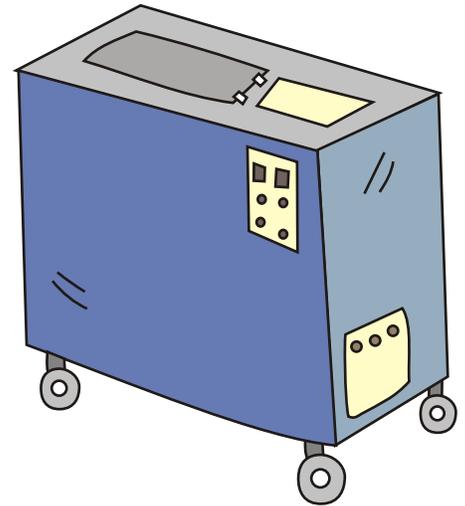
- High cost
 - Some units make a "hissing" noise
-

Unit Selection Considerations

- Greater ultrasonics power provides better cleaning ability
 - A 220-volt outlet is required for some units
 - Greater unit size provides more cleaning capacity
-

Cost:

\$5,000 to \$12,000



* From U.S EPA fact sheet "Aqueous Parts Cleaning" (see list of references).

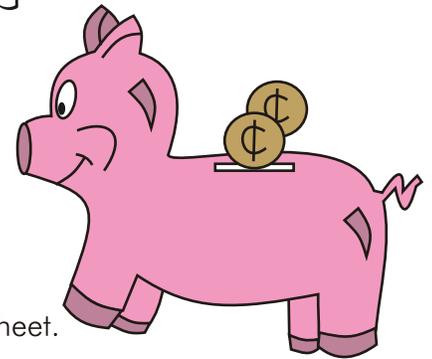
HOW MUCH WILL IT COST YOU TO SWITCH TO A HOT WATER PARTS WASHER?



U.S. EPA has a worksheet to help you calculate your costs of replacing solvent cleaning units with one or more types of hot water units. The worksheet is attached to the fact sheet *"Aqueous Parts Cleaning - Best Environmental Practices for Fleet Maintenance,"* U.S. EPA Fact Sheet, November 1999, (see reference list at the end of this handbook).

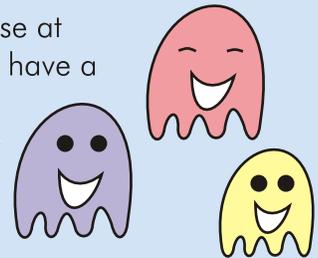
WHAT IS THE PAYBACK FOR SWITCHING TO A HOT WATER UNIT?

U.S. EPA's fact sheet *"Case Studies in Aqueous Parts Cleaning-Best Environmental Practices for Auto Repair Shops,"* November 1999 (also listed under the reference list) highlights nine auto repair shops that successfully switched from solvent to hot water based parts washers. Payback ranged from three months to 4.5 years for switching to hot water cleaning. There is a vendor/supplier list at the end of the case study fact sheet.



Success Stories: Microbial or Bio-remediating Units

The Texas Army National Guard purchased 10 microbial parts washers to use at various maintenance shops and equipment training sites. The parts washers have a built-in heater to keep the fluid at 105° F and have a filter to trap the larger pieces of grime. The filter needs to be replaced periodically to re-supply the microbe colony. The system eliminated the need to manage/dispose of contaminated cleaner. The per unit cost was approximately \$1,400. The system paid for itself after reducing purchase and disposal of as little as 100 gallons of solvent.



The Illinois National Guard purchased a microbial parts washer to remove varnish, dirt, oil and grease from automotive parts. They saved money by not having to dispose of a spent solvent; however, they did incur costs to dispose of the filters as hazardous waste due to heavy metal concentrations.

**Success Story:
Hot Water Parts Washers**

Two Ohio Department of Transportation (ODOT) garages switched to hot water parts washers and now prefer them over traditional solvent parts washers. ODOT's District 9 (Chillicothe) maintenance garage purchased a hot water parts washer in 2002 at a cost of \$6,880. Cleaning an engine with their traditional solvent parts washer could take six to seven hours of manual labor. But with their new washer, they can clean an engine in 10 to 20 minutes. In addition to faster completion of that task, they are also able to place the equipment and vehicles back into use much sooner. This is a time and labor reduction of 94 to 98 percent.



The ODOT District 10 (Marietta) maintenance garage purchased a hot water parts washer for \$5,400 in March 2005 to replace their solvent-based parts washer. The spray cabinet parts washers clean dirt and grease from equipment and vehicle parts. Employees have found that the new washers save time and reduce safety hazards, liability and waste disposal costs. While it used to take 20 minutes to clean a part manually with the solvent-based washer, it now takes the hot water parts washer just five minutes. This is a 75 percent reduction in time and labor. And since some of their parts weigh 100 pounds, physically maneuvering them for cleaning was difficult. Now they simply place the entire large part into the spray cabinet washer to clean.

Mechanics at both garages also like the new parts washers because they no longer have to breathe in solvent fumes, nor do they worry about spilling hazardous materials on the floor or flammability issues. Both ODOT districts are extremely pleased with every aspect of their hot water parts washers.

COMPLIANCE TIPS FOR AQUEOUS PARTS WASHERS



You must evaluate spent solution and filters to determine if they are hazardous waste. Cleaning solutions can become hazardous waste due to metals build-up (lead, chromium etc.)



Skimmed oil from hot water units may be managed under the used oil regulations and be recycled.



Spent solution may be able to be pre-treated and/or discharged to a city sewer/POTW if you obtain permission in advance. You should call your local wastewater pretreatment coordinator (in your city wastewater department) to discuss your specific situation.



An off-site waste-servicing company is an option for disposal. These services haul the spent solution to a location for proper treatment before disposal. Some vendors of hot water units offer this service.

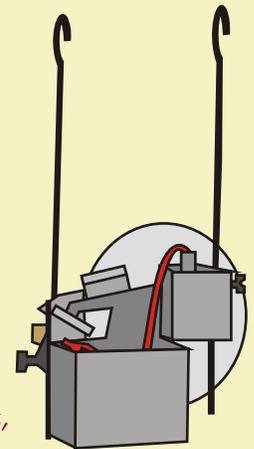
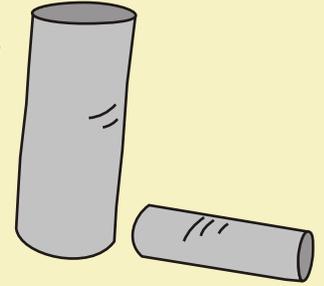


NEVER discharge spent solution to a septic system or storm sewer. Septic systems are not designed to handle this type of wastewater and storm sewers may discharge directly into streams or rivers, polluting the water and harming aquatic life.



You may use an evaporator to reduce the volume of solution prior to disposal. If your spent solution is hazardous and you do this, it is considered "treatment" under the hazardous waste rules. There are specific rules that apply to generators that treat their hazardous wastes. However, if there is release of hazardous waste to the environment (like the air), this would be considered illegal disposal.

Note: You should periodically evaluate your sludge, spent filters and solutions to determine if they are a hazardous waste. You should evaluate your waste each time your process changes or you change solutions.



For more information on evaluating hazardous waste, see DHWM's Hazardous Waste Generator Handbook: www.epa.state.oh.us/dhwm/pdf/gen_handbook.pdf

TIPS TO HELP MAINTAIN YOUR HOT WATER SOLUTION

- ★ **Filter your solution.**
- ★ **Skim the oil.** *(Microbial units don't need an oil skimmer because the microbes degrade the oil).*
- ★ **Accept solution discoloration.** *Many solutions turn gray or brown and still clean parts.*
- ★ **Change the solution** *when it doesn't clean anymore. You don't need to change it on a routine schedule.*
- ★ **Use a test kit** *from your supplier/vendor to determine when you need to add chemicals.*
- ★ **Evaluate using microfiltration** *(for very small particles). Some vendors offer this as an on-site service.*
- ★ **Consider a two-stage cleaning process.**

TIPS TO HELP MAINTAIN YOUR MICROBIAL UNIT

- ★ **Maintain the temperature.** *Microbes require a heated environment. Don't unplug the unit, even at night.*
- ★ **Don't contaminate the solution with aerosols or other contaminant sources.**
- ★ **Let microbes adapt to new soils.** *Be patient! After they digest new soils, cleaning performance should improve.*
- ★ **Don't pour oils or soils into the unit.** *A sudden overload may harm the microbes.*
- ★ **Monitor your sludge and oil accumulation.** *Significant oil accumulation can suffocate microbes.*

GLOSSARY

Boiling Point: The temperature at which a substance changes from a liquid to a gas.

Conditionally Exempt Small Quantity Generator (CESQG): A facility that generates less than 220 pounds (100kg) per month of hazardous waste.

Characteristic Waste: Waste that is considered hazardous under RCRA because it exhibits any four different properties: ignitability, corrosivity, reactivity or toxicity.

Drag-Out: The solution/cleaner that is on your parts when they are pulled out of the parts washer.

Flash Point: The lowest temperature at which a substance can ignite.

Land Disposal Restrictions (LDRs): This program ensures that toxic constituents present in hazardous waste are properly treated before hazardous waste is disposed of on the land (such as a landfill).

Large Quantity Generator (LQG): A facility that generates more than 2,200 lbs (1,000 kg) per month of hazardous waste.

Listed Hazardous Waste: Specific lists published in the U.S. EPA regulations. Each listed waste has its own unique waste code. These waste codes begin with F, K, P or U followed by three numbers.

Mixture Rule: If you mix a listed hazardous waste with a non-hazardous waste, the entire mixture becomes a listed hazardous waste. There are some exceptions to the mixture rule, but very few.

Payback: The length of time it takes to recover the capital cost of the equipment purchased. For example, a company buys a distillation unit for \$2,000 and calculates the time to recover the cost to be 1.5 years.

Publicly Owned Treatment Works (POTW): A treatment plant that handles sewage and wastewater from homes and businesses. Many POTWs are owned by a city.

Resource Conservation Recovery Act (RCRA): A federal law enacted in 1976 to address the treatment, storage and disposal of hazardous waste.

Septic System: A system designed to treat sanitary waste/wastewater generated from a one-family, two-family or three-family dwelling. Septic systems are commonly found at homes where sanitary sewers (a system of pipes to a POTW) are not available.

Small Quantity Generator (SQG): A facility that generates between 220 and 2,200 lbs. (100 and 1,000 kgs) per month of hazardous waste.

Still Bottoms: Residues left over from the process of recovering spent solvents in a distillation unit.

Storm Sewer: A collection system for rainwater. These types of sewers usually include the gutter systems seen along streets and roads. Rainwater collected in storm sewers travels directly to a ditch, stream, river etc., without being treated.

If you have additional questions regarding parts washers, please contact your Ohio EPA district hazardous waste inspector. Our hazardous waste inspectors offer technical assistance to businesses by helping them identify ways to generate less waste. The Regulatory Services Unit in the Division of Hazardous Waste Management (DHWM) can also assist you with questions on hazardous waste at (614)644-2917. If you would like to learn more about Pollution Prevention (P2), go to: www.epa.state.oh.us/ocapp/ocapp.html

REFERENCES

Managing and Reducing Parts Washer Wastes, Illinois Office of Small Business, 2004:
www.epa.state.il.us/small-business/parts-washer-wastes/

Waste and Cost Reduction Techniques for Small Parts Cleaners, North Carolina Division of Pollution Prevention, 2000: www.p2pays.org/ref%5C01/00024.htm

Adding a Filter to Your Parts Washer, Iowa Waste Reduction Center (IWRC):
www.iwrc.org/downloads/pdf/partsWasher1x1.pdf

Aqueous Parts Cleaning-Best Environmental Practices for Fleet Maintenance, U.S. EPA Fact Sheet, 1999, 10 pp.: www.epa.gov/region09/waste/p2/autofleet/fleetclean.pdf

Aqueous Brake Washers-Best Environmental Practices for Fleet Maintenance, U.S. EPA Fact Sheet, 1999, 3 pp.: www.epa.gov/region09/waste/p2/autofleet/brake.pdf

Case Studies in Aqueous Parts Cleaning-Best Environmental Practices for Auto Repair Shops, November 1999, 4 pp.: www.epa.gov/region09/waste/p2/autofleet/caseauto.pdf

Ohio Case Studies:

ODOT: Summer 2007 Notifier: www.epa.state.oh.us/dhwm/pdf/NotifierSummer07.pdf

Robin Enterprises Co.: www.epa.state.oh.us/dhwm/pdf/NotifierWinter06.pdf

Total Image Specialists: www.epa.state.oh.us/dhwm/pdf/Summer2006Notifier.pdf

Other resources:

You may find the following online training on Ohio EPA's Office of Compliance Assistance and Pollution Prevention (OCAPP) Web site for industrial parts cleaners helpful:
www.epa.state.oh.us/opp/partscleaningweb_files/frame.htm

OCAPP Fact Sheet: Extending the Life of Aqueous Cleaning Solutions:
www.epa.state.oh.us/opp/solvents/fact31.html

Ohio EPA, DHWM Hazardous Waste Generator Handbook, 2005:
www.epa.state.oh.us/dhwm/pdf/gen_handbook.pdf

DHWM Guidance Document: Use of Generator Knowledge In Complying with OAC Rule 3745-52-11 *Hazardous Waste Evaluation*, 2005:
www.epa.state.oh.us/dhwm/pdf/GeneratorKnowledge6.pdf

Ohio EPA rules and laws Web link: www.epa.state.oh.us/dhwm/laws_regs.html

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Thank you!