Aqueous Parts Cleaning

This fact sheet covers aqueous solutions used in parts cleaning equipment such as enclosed spray washers, sinks and dip tanks to remove oil, grease and other solid materials. A separate fact sheet, "Petroleum-Based Parts Cleaning Solvent," covers parts washers that use solvents such as mineral spirits and naptha.

What are some of the advantages associated with aqueous parts cleaning?

Aqueous cleaners are water-based solutions that do not contain hazardous volatile organic compounds (VOCs) and, unlike many petroleum-based solvents, are non-flammable. Instead of chemically dissolving oil and grease, they rely on heat, agitation and detergents to remove these contaminants from parts. Aqueous cleaners are less toxic than petroleum-based solvents and therefore are safer for employees to use.

To extend the life of cleaning solutions, aqueous systems are designed to remove oils and solids using skimmers and filters. In fact, cleaning solutions can last indefinitely if they are properly maintained. In all cases though, it is necessary to periodically add water and detergent formulations due to loss through evaporation, filtration and by being carried out on parts.

What is a microbial cleaner?

These are aqueous cleaning solutions typically used in conjunction with parts cleaning sinks that extend cleaner life by relying on microscopic organisms to consume oil, grease and other organic contaminants. Like other aqueous cleaning solutions, they perform best when heated. Solids need to be removed through filtration or other means and equipment manufacturers offer various recommendations for doing this.

How is spent aqueous parts cleaning solution regulated?

Because spent aqueous solution is likely contaminated with oil, grease and possibly metals like lead or chromium, there are environmental concerns associated with its disposal. Depending on the level of contamination, spent aqueous solutions may be regulated as hazardous waste. If approved for discharge, such solutions must be managed according to Vermont wastewater requirements.

What are the basic wastewater requirements?

Spent aqueous cleaning solutions that are non-hazardous may be discharged to a municipal wastewater treatment plant provided the business has received permission from both the municipality (treatment plant operator or other official) and the Department of Environmental Conservation's Wastewater Management Division. Be prepared to inform the plant operator about the volume of spent solution to be discharged, the pH and the contaminants likely to be present. If testing is necessary, take a sample of the wastewater near the end of its useful life.
Aqueous cleaning solutions should never be discharged to an on-site septic system since contaminants of concern are not treated in the soil environment and can result in groundwater contamination.

How are oils and solids removed from parts washers regulated?

Oils that are skimmed, filtered or otherwise removed from aqueous parts washers are subject to regulation either as "used oil" (refer to the "Used Oil" fact sheet for more information) or as hazardous waste under the Vermont Hazardous Waste Management Regulations. Oil that is managed as hazardous waste is identified by the VT02 hazardous waste code (i.e., wastes containing greater than 5% petroleum distillate).

Sediment and other solid materials that are removed from aqueous parts washers are regulated as solid or hazardous waste. Although these wastes generally do not meet hazardous waste criteria, any business generating this material is responsible for making a determination, based either on laboratory testing or his or her knowledge of the material (refer to the "Making a Hazardous Waste Determination" fact sheet for more information). Non-hazardous solids may be disposed of in the regular trash.

What contaminants should be tested for?

If a business decides that laboratory testing is necessary, it should only test for those contaminants likely to be present in the waste in order to keep the cost down. A "total metals" analysis can be used to screen for the specific metals of concern (i.e. lead, chromium or other regulated metal), and a "total petroleum hydrocarbon" (TPH) test can be used to determine the concentration of oil in the spent material. Samples of aqueous cleaning solutions to be sent for laboratory analysis should be taken near the end of the solution's useful life. Call Hazardous Waste Program staff (828-1138) or the non-regulatory Environmental Assistance Office (800-974-9559) for help in deciding what to test for and how to interpret results.

Can wastewater be evaporated?

Wastewater from an aqueous parts cleaning system may be evaporated provided:

- It is non-hazardous OR hazardous waste only because it contains greater than 5% by weight petroleum distillate material;
- Evaporation equipment has been approved by Vermont's Air Pollution Control Division (this is generally straight-forward and does not require a permit for pre-engineered systems); and
- Oily residue remaining after evaporation is managed either as "used oil" or as hazardous waste.

What are some Best Management Practices?

- Install cleaning equipment that uses water efficiently or is capable of recycling water.
- Remove heavy soils from parts with a scraper or rag before aqueous cleaning to reduce cleaning time, water usage, and the amount of contamination introduced into the cleaning solution.
- Conduct cleaning operations on an impervious surface.

For more information contact:

Vermont Department of Environmental Conservation:

Waste Management Division
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704
802-828-1138

Environmental Assistance Office
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704
800-974-9559