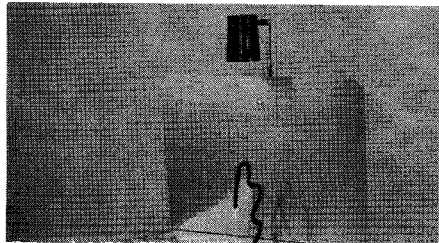


# Aqueous Parts Washers Minimize Hazardous Waste

In the past, industry had no alternatives but to use toxic solvents in order to clean and degrease machined parts. The last ten years have fashioned significant changes, due in part to the fact that the few safe products available did not perform satisfactorily in industrial applications. There was also no concerted effort on the part of legislators to effect change.

With increasing awareness of worker safety, rising environmental issues, and productivity concerns, Environmental Services Group, Englewood Cliffs, NJ created the TASC MASTER Aqueous-Based Parts



## GLOSSARY OF COMMONLY USED HAZARDOUS CHEMICALS

The following chemicals are among those most commonly used in the United States. Data is based on workplace exposure and compiled from the New Jersey Department of Health's *Hazardous Substance Fact Sheet*.

**Acetone:** High concentrations can cause dizziness and loss of consciousness. It can irritate the skin, eyes, nose, and throat.

**Aluminum Oxide:** It can irritate the eyes, nose, and throat. Repeated, high exposure can cause scarring of the lungs and shortness of breath.

**Ammonia:** Long-term exposure can cause irritation of the eyes, nose, mouth, and throat. It can also irritate the lungs and burn eyes and skin.

**Benzene:** This is a cancer-causing agent that has been shown to cause leukemia; it also may cause birth defects. Acute exposure causes headaches and irritation of the eyes, nose,

**Methyl Isobutyl Ketone:** This irritates the skin, eyes, nose, and throat, and may cause dizziness, nausea, diarrhea, and loss of consciousness. Long-term exposure may damage the liver and kidneys.

**Methanol:** It irritates the eyes, nose, mouth, and throat and can cause liver damage.

**Phenol:** Long-term exposure may damage the liver and kidneys and lead to genetic damage. It can irritate the mouth, nose, throat, and eyes. It may be a cancer risk; major skin contact or inhaling of it can lead to death.

**Sodium Hydroxide:** Breathing the

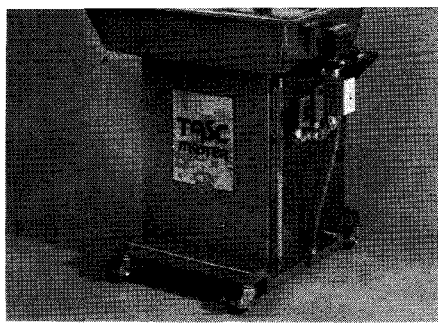
## Solvent vs. Aqueous Washers

Before using an aqueous-based system, the user must determine whether or not the parts to be cleaned can tolerate the effects of immersion in water.

This factor must be considered even though flash rusting of metal parts is not a common problem using an aqueous system as parts are quickly cleaned and removed. Rusting problems can also be easily corrected with the use of an additive in the rinsing process. However, it should be kept in mind that any parts cleaned in an aqueous system must tolerate water.

## System can reuse the same solution several times before disposal.

If water can be tolerated then the aqueous degreaser will enable the user to



*The TASC MASTER has the capability to separate greases from a biodegradable cleaning solution during use.*

Washer. It is designed to replace hazardous solvent systems and minimize waste disposal by incorporating a high-tech aqueous cleaner and a delivery system developed to maximize its effectiveness.

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## **Aqueous-based washers use biodegradable, environmentally safe, and non-toxic cleaners.**

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An aqueous-based parts washing system can typically avoid many of the dangers inherent in solvent-based washers because it can perform its functions using biodegradable, environmentally safe, and non-toxic cleaning agents.

A prospective user of a parts washing system should question the necessity of using a toxic solvent in order to accomplish a given cleaning/degreasing task. There are now many options available that are specifically designed to replace these harmful solvents.

### **Electronics Firm Reduces Waste**

Alpine Manufacturing of America, Inc. has converted from the use of Freon to

convulsions and death.

**Ethyl Benzene:** It can irritate the eyes, nose, and throat; high concentrations can lead to dizziness and loss of consciousness. Repeated contact can cause drying and scaling of skin and may cause liver damage.

**Ethylene Glycol:** This can irritate the eyes, nose, and throat and cause nausea, vomiting, and headaches. It may cause birth defects. Repeated or high exposure can lead to kidney damage or stones. Brain damage also may occur.

**Freon 113:** It may cause skin irritation and rashes as well as drowsiness. Freon also contributes to the "greenhouse effect."

**Glycol Ethers:** These can irritate the eyes, nose, and throat and may cause birth defects. Repeated or high exposure can cause kidney damage or stones. Brain damage also may occur.

**Hydrochloric Acid:** It can irritate the lungs, and high exposure can cause buildup of fluid in the lungs, which can cause death.

**Lead, Inorganic:** It can cause weakness and insomnia. Higher exposure can result in damage to the nervous and reproductive systems.

**Methyl Ethyl Ketone:** Exposure can cause dizziness, headaches, blurred vision, and loss of consciousness. It may cause birth defects.

clean machined parts and electronic processing equipment for printed circuit board assemblies to an aqueous-based parts washing system. Manufactured by Environmental Services Group, the TASC MASTER system has the capability to separate greases from a biodegradable cleaning solution during use.

Bernie Pierce, Vice President of Manufacturing at Alpine, states; "By removing fluxes, oils, and grease with the TASC

MASTER we can reuse the same cleaning solution several times before disposal. The solution and equipment costs were far less than we had expected for such positive cleaning results to occur."

**Sulfuric Acid:** This can severely burn the skin and eyes. Repeated long-term exposure can cause bronchitis, shortness of breath, and perhaps emphysema.

**Tetrachloroethylene:** This suspected human carcinogen has caused liver cancer in animals. It may damage the liver and kidneys after low but repeated exposure. It can cause dizziness and loss of consciousness.

**Toluene:** This can irritate the eyes, nose, and throat; high levels can cause dizziness and loss of consciousness. It can cause cell mutations and may damage fetuses. Long-term exposure may damage bone marrow, causing low blood-cell count; it also may cause drying and cracking of skin.

**1,1,1-Trichloroethane:** It may cause mutations in cells, can irritate the skin and eyes, and cause unconsciousness and death. High exposure may damage the liver and kidneys.

**Xylene:** This can irritate the eyes, nose, and throat; high levels can cause loss of consciousness and death. It may damage fetuses. Repeated exposure may damage bone marrow and eyes and cause stomach problems.

"Even though we recycled our Freon, the environmental risks and health hazards were still present," added Paul Kaupisch, Manager of Facilities and Safety. "These risks are no longer present with our new system."

avoid many of the precautions necessary in the proper use and disposal of hazardous solvents. Disposal of spent cleaning solution is an area that has often troubled plant managers and safety directors in the past. It is also an area in which aqueous- and solvent-based parts washers differ in function.

The standard solvent-based washer is incapable of separating greases and oils from the degreasing solution because those substances are actually emulsified into the solvent and in effect become part of the solution itself. Therefore, when the solution has become too contaminated to be effective, the entire amount of solvent in the parts washer must be removed and carted away for disposal.

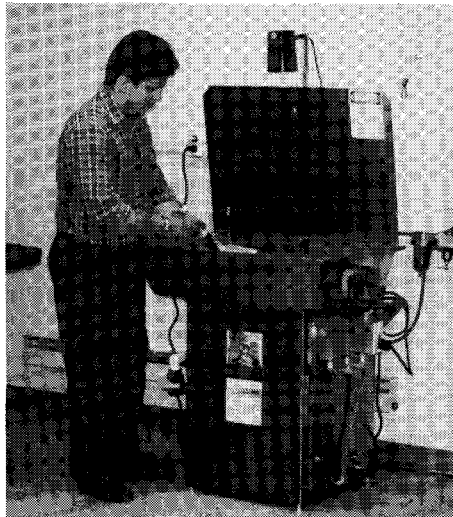
Although there are services available to the solvent user to remove or recycle waste there still remains the concern of worker exposure to hazardous solvents on a daily basis. Additionally, these services do not eliminate the hazards of airborne toxins from entering the atmosphere through factory ventilation systems.

In an aqueous-based parts washer that is properly equipped and uses an appropriate degreasing agent, the emulsification of greases and oils does not occur. Instead, greases, oils, and cutting fluids rise to and lay on the surface of the cleaning solution where they can be recovered using the Weir Bar feature incorporated into these units.

### **Weir Bar Feature Advantages**

In effect, the Weir Bar is a drainage trench that is molded into the upper sink and bottom tank of the unit. The greases and oils can be effectively skimmed from the surface by filling the parts washer to the level of the Weir Bar. As the greases and oils collect on the surface, they flow into a

## MACHINING



*Alpine converted from the use of Freon to clean machined parts to an aqueous-based parts washing system.*

holding tank at the bottom of the washer. A second Weir Bar connected to a spigot permits easy removal of the waste.

This design allows the cleaning solution to be reused many times and also contributes to waste minimization. Since the grease and oil removed from the parts can be recovered independent of the cleaning solution, the total waste requiring disposal can be reduced by as much as 80 to 90 percent.

In addition, the Weir Bar in the upper sink aids when using the unit to soak parts. When a basket of parts is sub-

### **Location And Ventilation**

Another factor that needs to be addressed with solvent-based parts washers is location. Virtually all Material Safety Data Sheets regarding solvents state that proper ventilation is essential. The location of a solvent-based system is also of prime importance. Installing a fan with an outside air duct is often the only way to insure proper air flow. However, further environmental concerns are then raised regarding the introduction of toxic fumes into the atmosphere.

An aqueous parts washing system, on the other hand, can use a non-toxic degreaser that emits no harmful fumes and has no discernible odor. Since concerns about providing adequate ventilation are no longer an issue, multiple work stations can be set up in various plant locations.

Where they can be used, aqueous-based systems can offer several advantages over solvent-based systems, including: 1. The elimination of the health risks to workers associated with the use of toxic solvents; 2. The reduction of hazardous waste to be disposed of; 3. The environmental benefits that result.

When they can be successfully incorporated into a production facility, aqueous-based parts washers are an option which should be seriously considered by any firm seeking to increase worker safety and minimize hazardous waste.

will once again rise to the surface and flow into the Weir Bar to the bottom tank. Once the surface of the cleaning solution is clear, the basket can be lifted from the solution without the parts being recoated with a layer of grease or oil.

#### For Additional Information...

- Environmental Services Group  
P.O. Box 1257  
Englewood Cliffs, NJ 07632

# Combine the best of both worlds.

## Cost effective parts cleaning and environmental safety.



Learn how you can meet health and environmental regulations in your facility with our **FREE** Video Presentation "How to minimize hazardous waste while increasing employee safety".

You will learn why it is not necessary to use dangerous solvents to effectively clean parts and machinery in industrial applications.

The video will demonstrate how our TASC MASTER parts washer can effectively separate grease and oils from your cleaning solution during operation by utilizing TASC powder, an environmentally and user safe aqueous degreaser.

Disposal of waste can be reduced by 85 to 90 percent over comparable solvent-based systems while at the same time eliminating safety and health concerns for your employees.

### ENVIRONMENTAL SERVICES GROUP

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Distributor Inquiries Invited.

The Environmental Services Group also stands ready to help you dispose of the reduced amount of waste separated by the TASC MASTER unit. Our nationwide fleet of trucks can remove your waste and provide your firm with the necessary documentation to insure compliance with all environmental regulations.

Don't delay! Call, fax, or write for our **FREE** Video today so that we all can share the benefits of a cleaner tomorrow.

