

# NAS NORTH ISLAND - NAVY REGION SOUTHWEST NAVY ENVIRONMENTAL LEADERSHIP PROGRAM

## POLLUTION PREVENTION

### VOC - FREE ENZYME CLEANERS

#### LEAD ACTIVITY

Naval Air Station (NAS) North Island

#### STATUS

Active

#### MISSION

Reduce hazardous waste disposal and air emissions created by volatile organic compound (VOC)-containing solvents

#### REQUIREMENT

Use of solvents containing VOCs in cleaning or degreasing ground support equipment or vehicle parts can have adverse environmental effects, including hazardous waste generation and ozone-depleting air emissions. Replacement of solvents with a more environment-friendly cleaning agent will help reduce these effects. These cleaning agents could be used at all Navy sites where parts washing takes place.

#### DESCRIPTION

Replacement of VOC-containing solvents with an enzyme-based bioremediation parts washer can eliminate the disposal of waste solvent as hazardous waste and eliminate the use of ozone-depleting substances. The SmartWasher Bioremediating Aqueous Parts Washer (SmartWasher), developed by Chem-Free Corporation, consists of a parts washer machine and a parts cleaning station for small parts. The parts washer machine initially washes the parts to remove any dirt or grime using a hand wash brush. The hand wash brush is a flow-through nylon bristle design for manual cleaning. It comes with a hose through which the cleaning solution is pumped continuously. The parts cleaning station uses a neutral mixture of emulsifiers, surface active agents, and microbes that does not contain VOCs, phosphates, formaldehydes, biocides, or solvents for degreasing and dispersing oil from the small parts. With the combination of the closed-loop parts cleaner and the microbe-impregnated filter, the cleaning solution does not require removal and replacement



SmartWasher

under normal operation. The unit is used to break down and remove oils, solvents, greases, ethylene glycol, and chlorinated hydrocarbons from small parts.

After successful use of the first SmartWasher in October of 1995, 20 enzyme bioremediation parts washers were procured through the Pollution Prevention Equipment Program (PPEP) for distribution at NAS North Island in November 1997. The Aircraft Intermediate Maintenance Department (AIMD), Naval Air Systems Command (NAVAIR), Combat Battalion Unit (CBU), the Morale, Welfare and Recreation (MWR) Auto Hobby Shop, and the Transportation/Vehicle Maintenance department of the Public Works Center (PWC) use the units to clean small aircraft or vehicle parts. The components washed at AIMD include ground support equipment (GSE) gasoline/diesel engine parts, brake parts, wheel bearing assemblies, and transmission, electrical, and hydraulic parts. Previously, all parts were cleaned using Safety Kleen parts washers, including methylene chloride tanks. In April 1996, the San Diego Air Pollution Control District (APCD) approved the use of the SmartWasher and deemed no air permit was required. At this time the Safety Kleen tanks were removed from the sites and the service contract was terminated.

A cost-benefit evaluation of the SmartWasher was conducted by NAS North Island in 1997. The SmartWasher was compared to the leased Safety Kleen system. Each SmartWasher unit costs about \$950, including initial fluid outfitting and filters. It was concluded that over a 10-year period approximately \$3,000 could be saved by using the SmartWasher. Cost savings include a reduction in personal protective equipment (PPE) needed during parts cleaning; a reduction of overall permitting costs at NAS North Island as no permit was required; and less time needed to change fluids, clean the unit, and dispose of waste.

## **BENEFITS**

- Risk factors associated with the use of SmartWasher cleaning solutions (for example, exposure to hazardous chemicals) are lower compared to the risk factors associated with solvent cleaning solutions; therefore, worker safety is increased
- An air permit is not required for use of the SmartWasher, since the water-based cleaner contains less than 10 percent VOCs
- Eliminates need for usage logs for VOC emissions, since air emissions are eliminated compared to traditional solvent cleaning methods

## **ACCOMPLISHMENTS/CURRENT STATUS**

<b>Date</b>	<b>Activity</b>
OCT 1995	Installed SmartWasher at PWC, CBU, MWR, NAVAIR, AIMD, and NAS North Island
OCT 1997	Performance evaluation questionnaire completed; response submitted to NAWC Lakehurst

## **FUTURE PLAN OF ACTION & MILESTONES**

<b>Date</b>	<b>Activity</b>
Ongoing	Continue use of SmartWasher units

### **COLLABORATION/TECHNOLOGY TRANSFER**

The Chem-Free Corporation SmartWasher was installed at AIMD, NAVAIR, PWC, CBU, and the MWR Auto Hobby Shop at NAS North Island. The parts washer could be exported to any facility that washes similar parts, including ground support equipment.

### **BIBLIOGRAPHY**

- [Navy Lakehurst Pollution Prevention Equipment Book:](#)

### **RELATED GOVERNMENT INTERNET SITES**

[Navy Lakehurst Pollution Prevention Equipment Book - Parts Washers](#)

### **RELATED NAVY GUIDEBOOK REQUIREMENTS**

- 01002 VOC and HAP Emissions Control from Solvent Cleaning Operations

*UPDATED: 01/23/02*