

**COMPETITIVE INITIATIVE
ENZYME BIOREMEDIATING PARTS WASHER (SMALL)
COST ANALYSIS**

The ChemFree SmartWasher SW-708 small enzyme bioremediating parts washer system consists of a parts washer machine and a parts cleaning station. The parts cleaning station uses a neutral mixture of emulsifiers, surface active agents, and microbes to degrease and disperse oil on smart parts. The mixture contains no VOCs, phosphates, formaldehydes, biocides, or solvents. With the combination of the parts cleaner and the microbe-impregnated filter, the cleaning solution does not require removal or replacement under normal operations. Specifically, the unit is used to remediate oils, solvents, greases, ethylene glycol, and chlorinated hydrocarbons from non-critical parts. The unit is designed to be installed and operational under shipboard conditions.

DATA COLLECTION PERIOD: 2 years

CURRENT SYSTEM: Safety-Kleen Unit

Consumables:

P-D-680: \$400/3 months = \$1,600/year
Gloves: \$8/week = \$416/year
Respirators: \$13/3 months = \$52/year
Respirator cartridges: \$8/month = \$96/year
Cost per year: \$2,164/year

Labor

E-3 labor rate: \$10.39/hour
Time per part: 10 minutes/part
Throughput per week: 150 parts

Estimate three minutes for setup, removal, and cleaning of respirators

Total time: 13 minutes/part

\$10.39/hour x hour/4.6 parts x 150 parts/week x 52 weeks/year

Total: \$17,618/year

Waste Disposal

Thirty (30) gallons of waste are generated per month. Waste disposal costs—a monthly service fee of \$144.37/unit—are included in the Safety-Kleen contract.

Total: \$1,733/year

Total Annual Costs

<u>Item</u>	<u>Cost</u>
Consumables	\$2,164
Labor	\$17,618
Waste disposal	<u>\$1,733</u>
Total	\$21,515

2. SmartWasher

Consumables

Consumables can be obtained through either an open purchase or a service contract with the manufacturer.

User Replacement

Solution: \$11/gallon x 25 gallons/15 months x 12 months/year = \$220/year

Gloves: \$2.75/week = \$143/year

Filter: \$6.24/filter/month = \$74.88/year

Enzymes: \$0.95/month = \$12/year

Total: \$450/year

Service Contract

Filter: \$10/3 months = \$40/year

Solution Changeout: \$9.50/month = \$114/year

Gloves: \$2.75/week = \$143/year

Total: \$297/year

Under normal conditions, the cleaning solution can be recycled through the unit indefinitely, with fresh solution being added occasionally.

Labor

E-3 labor rate: \$10.39/hour

Time per part: 13 minutes

Throughput per week: 150 parts

\$10.39/hour x hour/4.6 parts x 150 parts/week x 52 weeks/year

Total: \$17,618/year

Waste Disposal

None. Users have proven that the cleaning solution does not require disposal of the solution when the unit is used in accordance with the manufacturer's instructions.

Total Annual Costs

<u>Item</u>	<u>Cost</u>
Consumables	\$450
Labor	\$17,618
Waste disposal	\$0
Total	\$18,068

3. Cost Analysis Summary

Safety-Kleen Unit	\$21,515
SmartWasher Unit	\$18,068
Total Cost Change	\$3,447
Initial Procurement	\$934
Expected Service Life	10 years
Return on Investment (per 10-year period)	$[10 \times \$21,515] - [\$934 + (10 \times \$18,068)] = \$33,536$
Break-Even Point:	$\$934 / (\$21,515 - \$18,068) = 0.27$ years

SUMMARY

- SmartWasher reduces waste stream by 100%, saving \$1,800 in disposal costs.
- The SmartWasher solution is safe to use and does not require personal protective equipment.
- The SmartWasher solution can be used indefinitely with only occasional replenishment.