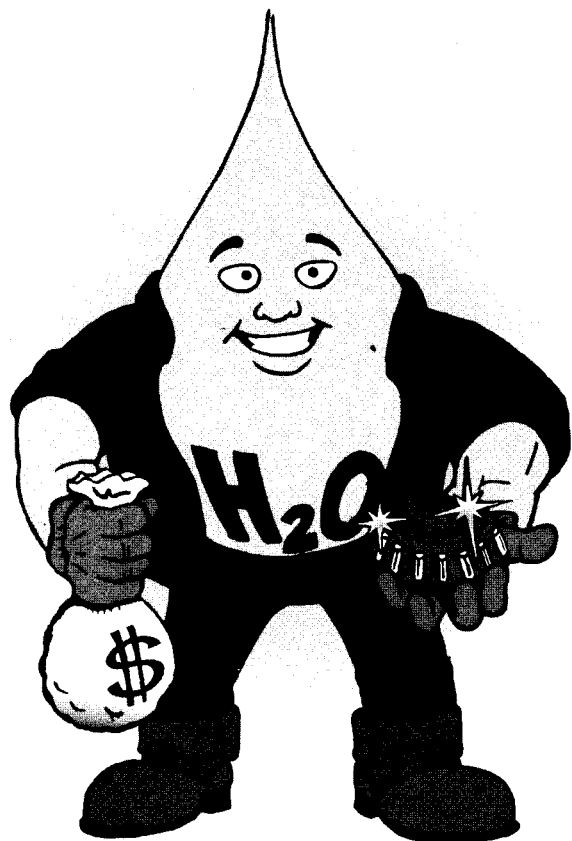




Case Studies in AQUEOUS PARTS CLEANING

Best Environmental Practices for Auto Repair Shops • November 1999



Aqueous Cleaning Works!

The case studies featured in this document are from studies conducted in California between 1997 and 1999. Each of the shops featured in these case studies successfully switched from solvent to aqueous (water-based) parts cleaning. These case studies prove that aqueous cleaners are capable of meeting or exceeding the many parts cleaning challenges encountered in a wide variety of auto repair operations.

New Environmental Regulations lead to Improved Aqueous Cleaners

The emergence of a new generation of highly effective cleaning units and solutions is the direct result of environmental regulations recently passed in two California air districts. To protect human health and reduce smog, aqueous parts cleaning solutions are favored or required over solvent cleaners. These new rules opened the parts cleaning market to new vendors and spurred innovation. Shop owners, facility managers and technicians benefit the most from the new rules, because compared to solvents, aqueous cleaners:

COST LESS • ARE SAFER TO USE • CLEAN EQUALLY WELL

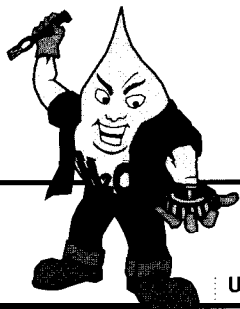
The public also benefits from the overall reduction in volatile organic compounds (VOC) emitted to the air as facilities switch from high VOC solvents to aqueous cleaners. The estimated VOC reductions as a direct result of enacting these new rules are 10 tons per day in the Los Angeles area and 2.1 tons per day in the San Francisco Bay Area! Widespread use of these new aqueous cleaners will hopefully bring about similar benefits nationally.

Tips for Successful Conversion

In selecting an aqueous cleaner for your shop, you should test more than one model to identify the model that works best for you. As the case studies show, often more than one type of unit is needed to fulfill all cleaning needs in a shop (for example, spray cabinet in combination with microbial sink-top). The good news is; in all but one case featured here, shops are saving significant money by switching to aqueous cleaning systems. Reduced labor spent cleaning parts account for most of these savings (as with automated spray cabinets and ultrasonic systems). Savings are also achieved through lower waste disposal costs, because aqueous cleaning solutions generally last longer than solvent. For more tips on making aqueous cleaning work for you, see the fact sheet entitled "Aqueous Parts Cleaning, Best Environmental Practices for Auto Repair". It can be obtained by calling (800) 490-9198 or viewed and downloaded at www.epa.gov/region09/p2/autofleet.

Testing the waters-aqueous parts cleaning case studies from California auto repair shops

CASE STUDIES IN AQUEOUS PARTS CLEANING, BEST ENVIRONMENTAL PRACTICES FOR AUTO REPAIR SHOPS				
Facility	Size	Operations	"Before"	"After"
SPECIALTY AUTO REPAIR				
¹ Diesel/Fuel Injection Specialties Santa Ana, CA	3 technicians	Repairs engines, sensors, and fuel injection systems— 1 person cleaned parts full-time	1 solvent immersion system serviced every 2 months	1 ultrasonic system
¹ Newhall Carburetor and Auto Repair Newhall, CA	1 technician	Rebuilds carburetors— 1 hour cleaning in unit plus 20 minutes by hand per carburetor. 20 carburetors cleaned/week	1 solvent carb cleaner tank serviced every 1.5 months and 1 aqueous microbial sink-top unit	1 ultrasonic system and 1 aqueous microbial sink-top unit
² Bob's Transmission and Clutch Simi Valley, CA	5 technicians	Repairs and rebuilds transmissions of all kinds	2 solvent sinks serviced every 1.5 months and 1 water-based spray cabinet	1 ultrasonic unit, 1 solvent sink and 1 aqueous spray cabinet
FULL SERVICE AUTO REPAIR				
³ Larry's Autoworks Mountain View, CA	14 bays 6 technicians	Full Service Shop— 12 hrs/week cleaning parts	2 solvent sinks serviced every 1.5 months	1 microbial sink-top unit 1 spray cabinet
⁶ Glenmoor Auto Repair Fremont, CA	8 bays 2 technicians	Full service shop— 1 hour/week cleaning parts	1 solvent sink serviced every 4 months	1 microbial sink-top unit 1 spray cabinet
⁵ Auto Electric and Fuel Concord, CA	3 bays 3 technicians	Large cleaning jobs sent to local steam cleaner	1 solvent sink serviced every 2 months	1 microbial sink-top unit
³ Corvette Service Company, Carpenteria, CA	3 full-time technicians, 2 part-time	Full service, restoration— 5 hours/week cleaning parts	1 solvent sink serviced every 2 months	1 spray cabinet
² Tomvo's Garden Grove, CA	3 technicians	Full service— 1.5 hours/week cleaning parts	1 solvent sink serviced every 1.5 months	1 immersion
AUTO DEALERSHIPS				
¹ Santa Monica Nissan Santa Monica, CA	18 bays 20 technicians	Full service— 33 hours/week cleaning parts	7 solvent sinks serviced every 1.5 months	50 gallon spray cabinet 4 leased microbial sink top units



New Unit Types	Unit Cost	Annual Savings*	Payback Period	Testimonial
Alpha Cleaning Systems ultrasonic unit with W.R. Grace cleaning solution	\$9,300	\$15,012	7 months	"The new system saves me time and money. It can clean fuel injectors in about 15 minutes and they look like new"
Alpha Cleaning Systems ultrasonic unit (18 cubic inch) with W.R. Grace cleaning solution, Zymo microbial unit and solution	\$3,000	\$3,412	11 months	"I save a lot of time with this system. All I do is turn the unit on and I can walk away and do other things"
Alpha Cleaning Systems ultrasonic unit with W.R. Grace Daraclean 257 solution	\$5,000	\$7,617	8 months	"This kind of system is revolutionary for cleaning valve bodies. One day all transmission shops will have at least one ultrasonic system"
EcoClean Bioflow20, PC solution	\$1,300	\$14,874	3 months	"The spray cabinet has improved our productivity as well as the cleanliness of our parts"
EMC Model 100(used system), ALO Jet solution	\$1,600			
EcoClean Bioflow20, PC solution	\$1,300	\$1,638	1.8 years	"The spray cabinet cleans parts so well they shine. Our guys like using both of these units"
EMC Jetsink, ALO Jet solution	\$1,700			
EcoClean Bioflow20, PC solution	\$1,300	\$940	1.5 years	"The solution is nice and warm, much easier on technicians hands than solvent. The units meets our cleaning needs very well"
Landa Model SJ-15, AX-IT solution	\$4,825	\$1,021	4.7 years	"Overall we are satisfied with the spray cabinet. We made this change because we wanted to stay in compliance and be progressive"
Mirachem w/servicing agreement, Mirachem 500 solution	\$700	\$274	2.5 years	"The Mirachem cleans all the parts very well and quickly. Our costs are lower because it does not need to be changed out as often as the solvent tank"
EMC spray cabinet, ALO Jet solution	\$4,000	\$10,825	5 months	"We need a cleaning system that works well and quickly...the parts cleaned in the spray cabinet are cleaned faster and better than with mineral spirits"
Kleentec Model 4000, Daraclean 257 solution	\$236 per unit per year			

*Annual savings includes cleaning labor, waste disposal, servicing, chemical purchase, and electricity costs.

References

We gratefully acknowledge the contributions of the following individuals and organizations whose referenced publications contain the original source material for this fact sheet:

- ¹ Water-Based Parts Washer Systems: Case Study Conversions prepared for U.S. EPA and Santa Barbara County Air Pollution Control District by Michael Morris and Katy Wolf, Institute for Research and Technical Assistance, Pollution Prevention Center, December 11, 1998, available at <http://home.earthlink.net/~irta/rprt0002.htm>
- ² Water-Based Repair and Maintenance Cleaning: Case Study Conversions prepared for Southern California Edison by Michael Morris and Katy Wolf, Institute for Research and Technical Assistance, Pollution Prevention Center, March 12, 1999, available at <http://home.earthlink.net/~irta/rprt0003.htm>
- ³ Final Report: Aqueous Cleaning Demonstration Project, City and County of San Francisco prepared for the City and County of San Francisco Hazardous Waste Management Program, Administrative Service Department, by Tetra Tech EM Inc., February, 1999. The executive summary of the report is available at www.epa.gov/region09/p2/autofleet. The full copy is at www.p2pays.org/ref/03/02197.pdf.
- ⁴ Final Report: Aqueous Cleaning Demonstration Project, City and County of Los Angeles prepared for the City of Los Angeles Environmental Affairs Department Hazardous and Toxic Materials Office, by Tetra Tech EM Inc., August, 1999. An executive summary of the report is available at www.epa.gov/region09/p2/autofleet.
- ⁵ Aqueous Parts Cleaning, Best Environmental Practices for Fleet Maintenance, part of this publication series.

CASE STUDIES VENDOR CONTACTS			
Alpha Cleaning Systems *	(805) 520-8057, (800) 729-2828	KleenTec	(800) 435-5336
EcoClean Corporation	(510) 797-4050	Landa, Inc.	(408) 998-3051, (800) 547-8672
EMC	(408) 292-9289, (562) 908-7696	Mirachem	(602) 966-3030, (800) 847-3527
For Best Cleaning Solutions, Inc.	(225) 334-6990	Safety-Kleen Corporation	(800) 344-5191
Global Sonics	(800) 437-7117	UniKleen	(310) 532-0353, (800) 930-4729
Graymills Corporation	(773) 248-6825	W.R. Grace	(708) 458-6811, (800) 854-1623

These vendors were featured in these case studies. Other vendors may provide similar or identical products and services.

Your state or Local government environmental agency has more information about compliance and pollution prevention for auto repair shops and fleet maintenance operations in your state or area. Additional fact sheets and information can be found at www.epa.gov/region09/p2/autofleet. This fact sheet is part of a package of fact sheets entitled either "The Pollution Prevention Tool Kit, Best Environmental Practices for Auto Repair" (publication number EPA-909-E-99-001) or "The Pollution Prevention Tool Kit, Best Environmental Practices for Fleet Maintenance" (publication number EPA-909-E-99-002). To obtain copies of either package, call (800) 490-9198. Accompanying videos, "Profit Through Prevention", are available at the same phone number for either auto repair (number EPA-909-V-99-001) or fleet maintenance (number EPA-909-V-99-002).

