

Installing an Aqueous Parts Washer at Western Nevada College

Carson City, NV



Key Findings:

- The use of an aqueous parts washer cut cleaning labor costs in half and eliminated the need for hazardous waste disposal
- A quick return justified the purchase of a high pressure spray cabinet

Annual Savings: \$6,745

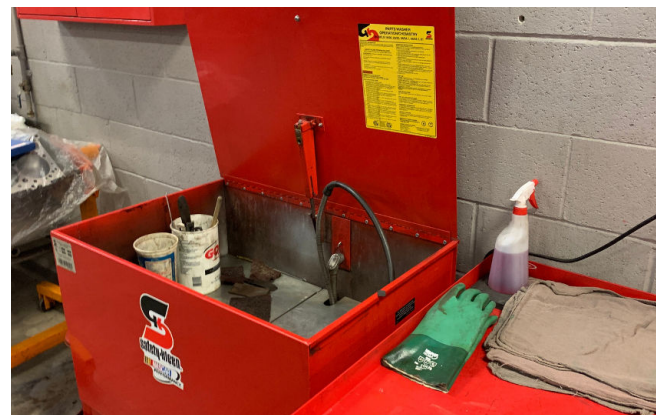
Annual Opportunity Cost: \$19,500

Hazardous Waste Reduced: 90 gal/year

Solvent-Based Parts Washers

The automotive industry sees a lot of oil, grime, grease, and carbon buildup that make the cleaning process time-consuming and meticulous. In the past, solvent tanks and aerosol brake cleaners were the primary methods of cleaning in auto repair shops. However, solvent parts washers pose a number of health risks and environmental concerns.

Petroleum-based solvents contain volatile organic compounds (VOCs), mineral spirits, and other solvents that quickly dissolve residues. While effective, these compounds cause irritation of the eyes, throat, and skin, as well as dizziness, headaches, and nausea. Long-term exposure of these toxic substances can even increase the risk of cancer, liver and kidney disease, and other health complications for system operators. Petroleum solvents are also highly flammable and considered a hazardous substance.



Western Nevada College's Solvent-Based Parts Washer

Aqueous Parts Washers

Aqueous parts washers, on the other hand, are water-based cleaners that contain little to no VOCs. As opposed to petroleum solvents, aqueous cleaners use water, powdered soap, high-pressure spray, and heat to remove baked-on contaminants. Not only are these parts washers just as effective, they also provide a safer work environment, they don't release toxic chemicals into the air, they don't contribute to ground-level ozone, and the solution is generally non-hazardous.

Aqueous parts washers are therefore considered a safe and effective alternative to solvent-based parts cleaners.

Western Nevada College

Western Nevada College (Carson City, NV) has an ASE-accredited automotive training program that covers bumper-to-bumper automotive technology coursework and hands-on training for students. Jason Spohr, the instructor who oversees the automotive program, put in a request for an aqueous parts washer, and in August of 2021, the college installed a brand new Snap-On aqueous parts washer in his auto repair shop.



A demonstration of the parts washer can be found on the Nevada Green Business Network's [website](#).

This high-pressure, 12-gallon capacity parts washer has an automatic soak cycle that enables workers to leave the unit unattended. The fully-enclosed washer also allows staff to manually clean parts using the viewing window and built-in gloves.

Previously, the auto shop used petroleum solvent to clean their parts, and prior to 2013, they paid Safety-Kleen to service their parts washer twice a year and recycle their spent solvents (over 90 gallons of petroleum naphtha every year). Annually, this process amounted to roughly \$1500.

When the shop realized their solvent did not require biannual distillation, they bought their own parts washer unit (about \$2,000) and ended their contract with Safety-Kleen. After that, the shop purchased petroleum solvent (one 55 gallon drum) every three to four years and disposed of the hazardous waste as needed, which only cost the college about \$350 a year on average.

Cost Savings and Benefits

This proved to be a cost-effective alternative to subcontracting another business to recycle their solvent. However, in 2021, the shop was still spending money on the disposal of solvent waste, and for Jason, his biggest concern was exposing his students to toxic substances, vapors, and carcinogens. By purchasing the aqueous parts washer, the shop was able to eliminate its largest hazardous waste stream and the costs associated with disposal. This also reduced the health and safety hazards attributed to solvent parts washers.



Another benefit of the aqueous parts washer was reduced labor costs. Because of the automated cleaning feature and the high-pressure spray nozzles, students spent less time scrubbing parts and stubborn residue. Students actually halved their cleaning hours, which, assuming a technician pay of \$25/hour, is approximately \$6,500 in annual savings per employee.

Table 1. Parts Cleaning Cost Comparison

Solvent-Based Cleaner (Safety-Kleen)	Annual Cost	Solvent-Based Cleaner (Self-Service)	Annual Cost	Aqueous Spray Cabinet	Annual Cost
Purchase Price (one-time)	N/A	Purchase Price (one-time)	\$2,000	Purchase Price (one-time)	\$6,000
Fuel Charge	\$20	Fuel Charge	N/A	Fuel Charge	N/A
Cost of Petroleum Solvent Recycling Services	\$1,450.00	Cost of Solvent	\$275	Cost of Cleaning Powder	\$100
		Petroleum Solvent Disposal Costs (Waste Management)	\$70	Solution Disposal Costs	\$0
Cleaning Labor Per Employee (10 hrs/wk)	\$13,000	Cleaning Labor Per Employee (10 hrs/wk)	\$13,000	Cleaning Labor Per Employee (5 hrs/wk)	\$6,500
Total Cost First Year	\$14,470	Total Cost First Year	\$15,345	Total Cost First Year	\$12,600
Total Cost Five Years	\$72,350	Total Cost Five Years	\$68,725	Total Cost Five Years	\$39,000

The table above provides a side-by-side cost comparison for the shop's petroleum-based solvent cleaning service (with and without Safety-Kleen), and their first year using the aqueous parts washer. For the purpose of this case study, we calculated the average cost of Safety-Kleen services from 2009 to 2012 based on documented waste manifests and financial records, and all other data points were sourced directly from Jason Spohr. Data was extrapolated over a five year period to illustrate the cost savings over time.

Table 2. Aqueous Parts Washer Cost Savings

Annual Cost Savings	\$6,745
Annual Opportunity Cost	\$19,500

Looking at annual costs (cleaning solution, disposal, and cleaning labor), the college will save approximately \$6,745 per year. This table also considers the opportunity cost per employee (the additional revenue from technician time saved) based on a \$100 shop rate.

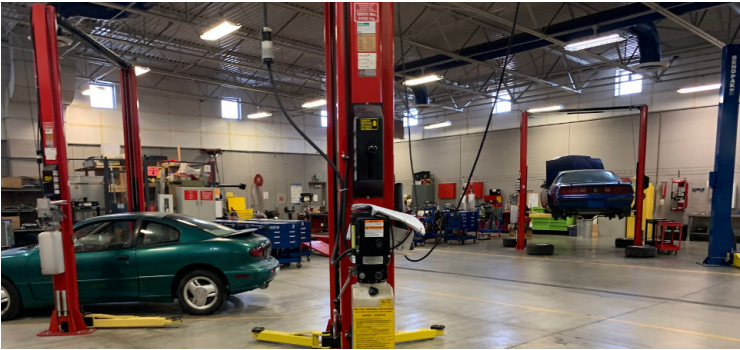
As a result, the parts washer increased productivity and opportunity costs as well. While a part is being cleaned, students now have more time to work and learn, and instructors like Jason have more time to teach their lesson plans. Furthermore, in a professional auto shop where staff can perform car repairs in that allotted time, this would mean approximately \$20,000 in additional annual revenue per employee (assuming a shop rate of \$100).



Parts Cleaned With Aqueous Parts Washer

Takeaways

Although the capital investment for the aqueous parts washer is costly, the data suggests that an auto repair shop would recoup those costs within the first year due to reduced labor costs, cheaper cleaning solution, and little to no hazardous waste.



Jason Spohr has already seen the advantages of switching to the spray cabinet, from safety improvements to instructional benefits. “I love this thing,” he says. “It’s much more time efficient, and the parts end up really clean, which demonstrates a good work ethic to our customers.”