

Onsite Antifreeze Closed-Loop Recycling

Onsite closed-loop antifreeze recycling consists of connecting equipment directly to the vehicle. The recycling unit removes the antifreeze, treats it, replaces additives and returns the antifreeze to the vehicle. Because the antifreeze isn't removed and containerized, it is not considered a waste, and is therefore not a potential hazardous waste. This method of recycling offers the peace of mind of not having to deal with a potential hazardous waste⁽¹⁾.

Most closed-loop systems employ filtration technology. Filtration is the most common form of antifreeze recycling, incurring the lowest capital cost. Antifreeze passes through several filters, each with a greater filtering capacity. Filtration however, only removes sediment and does not remove dissolved solids and chemicals from the antifreeze. Filtered antifreeze must be rebalanced with the appropriate additives before being returned to the vehicle. All closed-loop systems perform both the filtration and rebalancing steps⁽²⁾.

Although used antifreeze recycled in a closed-loop system does not need to undergo a hazardous/non-hazardous waste determination, the process does generate potentially hazardous used filters. Contact the IWRC for assistance in managing potentially hazardous waste.

Recycling used antifreeze onsite is a smart move, both environmentally and economically. Antifreeze is derived from petroleum products, and is not a renewable resource. Antifreeze can be recycled and reused indefinitely, so recycling makes sense. Recycling also ensures that waste antifreeze is managed safely, that it is not improperly dumped down the drain or sewer or into a septic system, where it can contaminate drinking water. Recycling onsite also eliminates transportation-related pollution from the delivery of new antifreeze and the shipping of waste antifreeze to a recycling plant. It also eliminates production-related pollution and energy consumption by both production and recycling plants⁽³⁾.



The biggest potential cost benefit to recycling onsite is eliminating or greatly reducing the amount of virgin antifreeze purchased.

Use our [Onsite Closed-Loop Recycling Cost-Benefit Calculator](#) to determine if purchasing equipment would be cost-effective for you.

References

- (1) [GreenTruck.com](http://www.GreenTruck.com)
- (2) United States Environmental Protection Agency, Department of Solid Waste and Emergency Response, 'Comprehensive Procurement Guidelines, Buy-Recycled Series, Vehicular Products.' May 2004. <http://www.epa.gov/epaoswer/non-hw/procure/products/engine.htm>
- (3) Silverspot Consulting, silverspot@optonline.net

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Antifreeze Recycling Worksheet - Onsite Closed-Loop Recycling

	CURRENT USED ANTIFREEZE HANDLING	YOUR FACILITY	EXAMPLE
A	On average, how many gallons of used antifreeze do you generate per year?		750
B	How do you currently dispose of your used antifreeze? 1. Down the Drain* 2. Onsite Recycling (Batch System) 3. Offsite Recycling Service		Down the Drain
C	How much do you currently pay per gallon for antifreeze disposal/treatment?		\$0.00
D	Has used antifreeze from your facility undergone TCLP testing?		No
E	How much money do you spend annually to purchase virgin/recycled antifreeze?		\$3,375
F	Total Current Annual Cost (A x C) + E		\$3,375
G	Total Current Cost Including One-Time TCLP Testing for Used Antifreeze: Average Testing Fee = \$425 (F + \$425)		\$3,800

* Dumping used antifreeze down the drain is not an acceptable method of disposal.

Switch to onsite or offsite recycling and contact the IWRC (at 1-800-422-3109) for additional information/assistance.

	ONSITE CLOSED LOOP RECYCLING	YOUR FACILITY	EXAMPLE
H	Average time required to recycle antifreeze from one vehicle (hours)		0.5
I	Average number of vehicles serviced annually		50
J	Annual maintenance/repair costs, if any		\$0
K	Unit purchase and shipping costs		\$3,800
L	Unit installation costs, if any		0
M	Annual cost for additives [(A / 30) x \$48]		\$1,200
N	Annual cost for filters		\$70
O	Unit voltage (volts)		110
P	Unit current (amperes)		5
Q	Energy cost per kilowatt-hour		\$0.12
R	Annual cost to dispose of recycling wastes (other than antifreeze)		0
S	Total Capital Cost (K + L)		\$3,800
T	Total Annual Cost Onsite Closed-Loop Recycling [(E x 25%) + J + M + N + R + ((O x P)/1000 x Q x H x I)]		\$2,115
U	Total Annual Cost Including One-Time TCLP Testing for Filters: Average Testing Fee = \$425 (T + \$425)		\$2,540
V	Annual cost difference between onsite closed loop recycling and current disposal methods (T - F)		-\$1,260
W	Payback period in years for onsite closed loop recycling (S / V)		3.02yrs.

❖ Information derived from the fact sheet 'Antifreeze Recycling, Best Environmental Practices for Auto Repair and Fleet Maintenance,' United States Environmental Protection Agency, Department of Toxic Substances Control, November 2001.

❖ This worksheet is meant to give only an approximation of costs and payback periods.