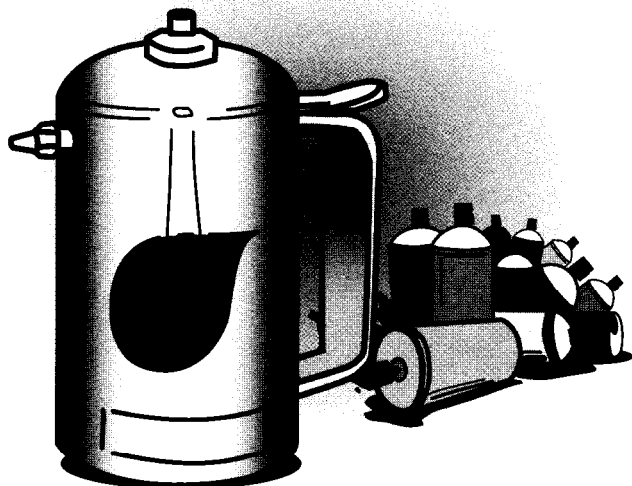




REFILLABLE SPRAY BOTTLES

Best Environmental Practices for Auto Repair and Fleet Maintenance • November 1999



What's wrong with aerosol cans?

When compared to refillable spray bottles, they are expensive and have greater environmental consequences:

- Ounce for ounce, spray-on product sold in aerosol cans is roughly twice the cost of bulk product.
- You pay for propellants in every aerosol can you purchase. Most aerosol cans contain 10-15% propellant by weight.
- Carbon dioxide, propane, and butane are commonly used aerosol propellants. These are "greenhouse gases" that contribute to global warming and smog formation.
- Every year, individual auto repair and fleet maintenance facilities discard hundreds, and sometimes thousands, of aerosol cans used to dispense brake cleaners, carburetor cleaners, lubricants and penetrants, engine degreasers, and numerous other products as trash, taking up valuable landfill space.
- Used aerosol cans that are not empty may be considered hazardous waste by US EPA and many states.

Shops and facilities that switch to refillable spray bottles are saving money by avoiding the high cost of aerosol cans and are helping to protect the environment by eliminating the solid and potentially hazardous waste stream they produce. This fact sheet is designed to help auto repair shop owners and fleet managers make informed decisions about implementing refillable spray bottles.

What are refillable spray bottles?

There are two basic types of refillable spray bottles: 1) metal bottles that spray product using compressed air and 2) plastic bottles that use a hand pump to spray product. Refillable metal bottles more closely resemble aerosol cans in terms of their design and performance. These bottles are filled with product (for example, brake cleaner) from a bulk container and are pressurized with air at 80 to 200 pounds per square inch using a compressed-air hose. Plastic bottles are also filled from bulk containers but do not require compressed air. Instead, they are operated by pumping a trigger to create a mist or stream of product.

REFILLABLE SPRAY BOTTLES: PERCEIVED PROBLEMS AND REAL SOLUTIONS

Perceived problem	Real solution
1 Refillable spray bottles require more labor time because they must be refilled.	The time needed to refill a bottle (1 to 3 minutes) is comparable to the time needed to dispose of an aerosol can and obtain a new one.
2 Spray nozzles clog.	Clogs rarely occur, but when they do, they can usually be eliminated by blowing compressed air through both sides of the spray nozzle. As a preventative measure, technicians should clear spray nozzles with compressed air weekly, and keep dirt and grime out of the bottles when filling by using funnels with filters or screens.
3 Refillable spray bottles are cumbersome.	Bottles the size of typical aerosol cans are available, and nozzle extensions can be attached to larger bottles.

What to consider when selecting refillable spray bottles

Capacity. The capacity of air-pressurized, refillable spray bottles varies from 7 fluid ounces to 1 quart. Smaller bottles are useful for spraying hard-to-reach areas. Larger bottles are more convenient because they require less frequent filling and therefore less technician time.

Construction material. Refillable spray bottles are available in different materials and with different finishes (aluminum, stainless-steel, brass, and steel) for use with different types of bulk product. Ask the spray bottle manufacturer whether the bottle is compatible with the product you intend to use.

Nozzle type. 1-quart, refillable spray bottles come with standard spray and stream nozzles. A nozzle that can be adjusted from stream to spray is also available. Smaller bottles (16- and 8-fluid ounce) are available that closely resemble the size and shape of aerosol cans and have a spray pattern similar to an aerosol can spray.

Nozzle extensions. Nozzle extensions up to 12 inches long are available for spraying areas that are otherwise difficult or impossible to reach.

Cost. Air-pressurized, refillable spray bottles cost from \$25 to \$60 each, depending on the construction material. Chemically resistant plastic bottles and hand pumps cost from \$1 to \$6 each. Be sure to check with the product vendor about plastics that are compatible with their chemical product.

Economy. Ounce for ounce, bulk product is cheaper than aerosol cans. Most common spray-on products are available in containers ranging in size from 1 to 55 gallons. You may be able to obtain free refillable spray bottles from your vendor when you purchase their product.

Maximizing benefits

Refillable spray bottles do work and can reduce costs-if they are used correctly. Therefore, be sure to:

- Avoid product losses due to spills during refilling. Use funnels and pumps to minimize spills (see next page for details).
- Keep replacement parts on hand. Small, inexpensive parts such as nozzle seals, filler caps, valves, and nozzles may deteriorate with repeated use and pressurization.
- Refillable spray bottles will be used if they are as convenient for workers as aerosol cans; therefore, provide every technician with a refillable spray bottle for each type of frequently used aerosol product.
- Water in the shop air lines may cause corrosion in some steel refillable spray bottles. Ensure that your shop air supply has a water removal device.

Recycle used aerosol cans

- Under the federal Resource Conservation and Recovery Act (RCRA), aerosol cans may be recycled if they have been emptied through normal use or punctured and drained to remove significant liquids.
- Some states such as California have more stringent regulations than RCRA. Be sure to investigate state regulations before recycling aerosol cans.
- Shops are responsible for properly managing any captured wastes recovered from puncturing and draining.

WHAT'S WRONG WITH THIS PICTURE?

Many shops stock and use more types and brands of aerosol products than necessary. Use of refillable spray bottles helps reduce excess inventory.



Case studies:

Cost-effective aerosol can reduction

Three auto repair shops (Nielsen Automotive in San Carlos, CA; Glenmoor Auto Repair in Fremont, CA; and Salem Boys Auto in Tempe, AZ) and one fleet maintenance facility (City of Sunnyvale, CA) contributed information regarding their use of pressurized, refillable spray bottles. This information is summarized below.

Very few implementation problems occurred at the shops. One shop had problems with minor spills during bottle refilling. To prevent such spills, the shop modified a \$2.00 hand pump to fit a 1-gallon bulk product container. While the pump eliminated spills; it increased the refilling time from about 1 minute to 3 minutes per bottle. Another shop also had a nozzle clog, which was corrected by blowing compressed air through both sides of the nozzle.

Shop owners and fleet managers noted the following refillable spray bottle advantages:

Cost Savings. "We reduced our aerosol product costs by 84 percent for the same brake cleaner by switching to refillable spray bottles and eliminating aerosol can disposal costs."

Efficiency. "Technician efficiency is improved!

A technician requires about 1 minute to... refill and pressurize a spray bottle, which is much less time than it took to walk to the storeroom to get a new aerosol can. In addition, we realized a cost savings by reducing the time needed to order and stock aerosol cans."

Ease of Use. "Our technicians find the refillable spray bottles easier to use than aerosol cans because the bottles give a more predictable shot of product."

Preferred by Technicians. "Refillable spray bottles work as well as or better than aerosol cans."

Tip. "I use a part-time student worker to top off bottles two to three times per week, which further saves technician time."



	Nielsen Automotive	Glenmoor Auto Repair	Salem Boys Auto	City of Sunnyvale
BEFORE				
Technicians	9	2	10 to 12	10
Service bays	6	8	20	12
Aerosol cans per year	780 (brake cleaner)	192 (brake cleaner) 288 (carb cleaner) 36 (lubricant)	1,560 (brake cleaner) 540 (carb cleaner)	260 (brake cleaner)
Aerosol can product cost per gallon	\$15.95	\$38.90 (brake cleaner) \$24.32 (carb cleaner) \$38.89 (lubricant)	\$16.54 (brake cleaner) \$15.45 (carb cleaner)	\$32.96
Pressurized, refillable spray bottles	4 (1-quart)	6 (1-quart) 3 (10-ounce)	30 (1-quart)	10 (1-quart)
AFTER				
Total cost for refillable bottles	\$200	\$450	\$0 (free for purchasing bulk product)	\$400
Refilling time	3 minutes	3 minutes	1 minute	1 minute
Bulk product cost per gallon	\$9.89	\$15.60 (brake cleaner) \$18.20 (carb cleaner) \$23.80 (lubricant)	\$6.36 (brake cleaner) \$7.54 (carb cleaner)	\$14.00
Annual savings	\$484	\$926 (brake cleaner) \$490 (carb cleaner) \$45 (lubricant)	\$1,570 (brake cleaner) \$465 (carb cleaner)	\$1,654
Payback period	5 months	4 months (overall)	immediate for both	3 months

Cost savings and payback

Use the worksheet below to evaluate refillable spray bottle costs and potential savings for your facility. The worksheet does not include the technician time to refill spray bottles because it is usually comparable to the time required to throw away an aerosol can and obtain a new one. This worksheet should be completed for each type of aerosol can product that might be replaced by refillable spray bottles; that is, you should make several copies of the worksheet and use one for each product type. The data in the sample column below is from an actual shop—it may not be representative of your shop's costs.

AEROSOL CAN USE	your facility	sample
A Number of aerosol cans used annually		780
B Fluid ounces per aerosol can		13
C Cost per aerosol can		\$1.62
D Gallons of liquid aerosol used annually (A x B ÷ 128 ounces per gallon)		79
E Annual aerosol can disposal cost		Negligible
F Total annual aerosol can cost (A x C + E)		\$1,264
SPRAY BOTTLE USE		
G Number of refillable spray bottles needed (assume one per mechanic)		4
H Unit capital cost for spray bottles and accessories		\$50
I Bulk product purchase cost per gallon		\$9.89
J Total annual bulk product purchase cost (D x I)		\$780
RESULTS OF SPRAY BOTTLE USE		
K Capital cost (G x H)		\$200
L Annual savings (F - J)		\$484
M Payback period (years) (K ÷ L)		0.4

4 COST SAVINGS WORKSHEET

Payback threshold

If you use more than 20 cans of brake cleaner or carburetor cleaner per month, you can purchase five refillable spray bottles at \$50 each with a payback of less than 1 year. This payback threshold was determined by assuming the following:

- a shop uses 13-fluid-ounce aerosol cans at a cost of \$2 per can
- no disposal costs are incurred for aerosol cans
- bulk product costs \$10 per gallon.

VENDOR CONTACT INFORMATION	
Air-pressurized spray bottles	Bulk product
Milwaukee Sprayer Mfg. Co. Inc. (800) 558-7035	Zep Mfg. Company (408) 739-3656
	MOC Products Co. Inc. (818) 896-2258
Hand-pumped spray bottles	
McMaster-Carr (732) 329-3200	Tiodize Co. Inc. (714) 898-4377
Impact Products (419) 841-2891	CRC Industries Inc. (800) 272-8963
Tolco Corporation (419) 241-1113	Berryman Products Inc. (817) 640-2376
	Gold Eagle Co. (773) 376-4400

These vendors provided information for this fact sheet. This list is not complete: 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-pg-002).

