



# P2 for Vehicle and Small Engine Maintenance Operations

Almost all higher education facilities have some sort of vehicle maintenance program—an employee motor pool, grounds maintenance equipment, or technical training programs for automotive repair or body shop training for vo-tech students.

Waste streams such as used oil and antifreeze, brake and transmission fluids, parts-cleaning solutions, waste paints, and paint thinners are common hazardous wastes from vehicle maintenance operations. Each of these must be handled carefully to avoid contamination of the environment and to maintain compliance with environmental regulations. Pollution prevention (P2) can be used by operators in these departments to reduce the amounts of wastes generated from poor materials management and spills and leaks.

## Used oil

Used oil is usually generated on a year-round basis in vehicle maintenance operations. Although used oil is not considered a hazardous waste as long as it is recycled, it's very important for operators to manage this waste stream with care. If large quantities are stored on site, the facility may need to have a spill prevention, control, and countermeasure (SPCC) plan to address potential oil spills. Containers must always be labeled "Used Oil" *not* "Waste Oil." Used oil should never be mixed with

waste solvents considered hazardous wastes or the entire mixture will become hazardous and could not be burned in a used-oil space heater. However, used transmission fluid, power-steering fluid, differential oil, and transaxle fluid can be added to used oil.

## P2 for used oil and transmission fluids

- Use a collection funnel to collect drained oil to prevent spills.
- Never mix used oil with a "listed" or characteristic hazardous waste.
- Keep floors clean of dirt, kitty litter, and other absorbent materials to promote cleanup of oils with a squeegee and dust pan. Recovered oil can then be put with used oil for recycle; residual oil can be wiped up with a rag.
- Burn used oil in a space heater to heat the shop, or give to the power house if it burns fuel oil for energy production.
- Use longer lasting synthetic oils to minimize the amount of used oil and used oil filters generated.
- Use secondary containment to eliminate impacts from spills and leaks.

## Regulatory resources for used oil

- KDHE's "Used Oil Generators" Technical Guidance Document HW 99-01  
<http://www.kdhe.state.ks.us/waste/guidance/hw99-01.pdf>
- KDHE's "Used Oil: On-Site Burning in Space Heaters" Technical Guidance Document HW 98-02  
<http://www.kdhe.state.ks.us/waste/guidance/hw98-02.pdf>

## P2 for vehicle and small engine maintenance operations

### Brake and clutch systems

Brake fluid can be combined with used oil if it is not contaminated by chlorinated solvents. Check the label on the brake fluid can and on your brake-cleaner solution— if your shop is flushing brake lines with a chlorinated solvent, the brake fluid may be contaminated enough to become a hazardous waste. Many brake shoes and clutches still contain asbestos—never use compressed air to clean these systems. Using a compressed-air hose to clean drum brakes can release up to 16 million asbestos fibers in the cubic meter of air around a mechanic's face. Instead, use a high-efficiency particulate air filter (HEPA) vacuum or a damp rag to wipe the area clean to reduce the amount of asbestos released into the air.

#### P2 for brake and clutch system repairs

- Use non-chlorinated brake fluids to enhance recycle capability.
- Use non-chlorinated cleaning fluids to enhance recycle capability.
- Buy asbestos-free brake shoes when available.
- Use enclosed equipment for brake cleaning, which slips over the brake assembly and forms a tight seal against the backing plate.
- Double-bag asbestos materials in heavy plastic or plastic-lined bags for disposal. Without squeezing out the air, twist the neck of each bag into a “gooseneck,” wrap duct tape around it, and place in a labeled container. When the container is full, notify your trash service you have asbestos material to pick up.
- Use pre-ground, installation-ready brake linings and clutch facings when possible.

#### Regulatory resources for asbestos-containing materials

- Asbestos material is considered a “special waste” in Kansas. Call Richard Bronaugh, Kansas Department of Health and Environment

(KDHE) at 785-296-1120 for more information, or go to

[http://www.kdhe.state.ks.us/waste/download/spec\\_wd\\_req\\_FORM.pdf](http://www.kdhe.state.ks.us/waste/download/spec_wd_req_FORM.pdf) for the online permit and instructions.

- Businesses with asbestos waste in Johnson County go to <http://search.jocogov.org/> for a copy of the Kansas Statute on asbestos-related wastes and to <http://search.jocogov.org/> for the Johnson County special waste disposal application.

### Antifreeze

Engine coolant is toxic to animals and humans, can be contaminated with lead and other heavy metals, and should *never* be poured on the ground or in waterways. In Kansas, used antifreeze that is recycled, on site or off site, is not considered a hazardous waste. However, if it is disposed as a waste, a hazardous waste determination must be made; if hazardous, cleanup materials from spills will also be a hazardous waste and must be managed accordingly.

#### P2 for used antifreeze

- Reuse antifreeze in vehicles where possible (may require chemical additives).
- Recycle antifreeze through an on-vehicle filtration system or in a bulk-batch system.
- Use a mobile recycling service to come to your facility to recycle used antifreeze.
- Sell or give away used antifreeze as a product.

#### Regulatory resources for antifreeze

- KDHE’s “Management of Used Antifreeze” Technical Guidance Document HW 97- 02 <http://www.kdhe.state.ks.us/waste/guidance/hw97-02.pdf>
- “Pollution Prevention for the Automotive Maintenance and Repair Industry” [http://www.sbeap.org/ppi/publications/ppi\\_auto\\_manual.pdf](http://www.sbeap.org/ppi/publications/ppi_auto_manual.pdf)

## **P2 for vehicle and small engine maintenance operations**

- Testing options can be found in the fact sheet, “Regulated Metals: The Rule of 20” <http://www.sbeap.org/ppi/publications/rule-of20.pdf>

### **Waste fuel**

Waste fuel is generated when gasoline and diesel fuels become contaminated with water or when fuel is removed from tanks needing repairs. These fuels should be used for their intended purpose if possible; however, if the fuel is no longer usable in your vehicles, it can be picked up by a fuel blender as a non-hazardous waste. Waste-fuel containers must be kept closed at all times and handled carefully to avoid spills and sparks that could lead to fires or explosions. Waste-fuel containers must be labeled “Waste Gasoline” or “Waste Diesel.” If the waste fuel cannot be burned for energy recovery by a fuel blender, it must be handled as a hazardous waste. Waste fuel should not be mixed with used oil or poured down drains.

#### **P2 for waste fuel**

- Filter fuel and put fuel back in the gas tank after it’s repaired; if contaminated with water, it may be possible to decant gasoline off and reuse.
- Give fuel to employees to use.
- Send fuel out for energy recovery.
- Keep fuel containers closed at all times to eliminate vapor escape.

#### **Regulatory resources for waste fuel**

- KDHE’s “Petroleum Product Mixed With Water” Technical Guidance Document HW 97-01 <http://www.kdhe.state.ks.us/waste/guidance/hw97-01.pdf>

### **Parts cleaners**

Parts washing usually must be done to parts before repairs can be made. This cleaning process can be done by hand using solvent or aqueous-based cleaners; in an enclosed, automated hot soap system; by hot- or jet-blasting; or in bake-off ovens. No matter how your shop cleans its parts, the waste solutions or solid materials left after cleaning can become a hazardous waste due to the types of cleaner used and the buildup of regulated metals that come from engine components. Although it may be hard to eliminate the hazardous nature of waste parts cleaners, there are many ways to reduce the amount of wastes generated by this process.

#### **P2 for parts washing**

- Use an enzyme washing system. No waste is generated on a regular basis; solution is replenished with enzyme “cleaner” as needed. However, sludge and solution will need to be tested for regulated metals’ content when the unit is cleaned out, which usually occurs every two to three years.
- Recycle cleaning solvent on site in a distillation unit. Ninety percent of solvent can be recovered each cycle, representing a considerable savings in waste disposal and raw material costs. A hazardous waste determination must be performed on sludge.
- Use an aqueous hot soap washer. These units save operator labor and time and eliminate operator exposure to solvent vapors; however, aqueous solutions can become hazardous due to regulated metals’ buildup. If cleaning solution is not hazardous, the water can be evaporated; sludge will need to be tested for regulated metals.
- Do more mechanical cleaning with wire brushes or rags to remove as much soil as possible before washing.
- Clean only parts being worked on.

## P2 for vehicle and small engine maintenance operations

### Regulatory resources for parts cleaners

- KDHE's "Use of Evaporation Units" Technical Guidance Document HW 95-03  
<http://www.kdhe.state.ks.us/waste/guidance/hw95-03.pdf>

### Waste paints and paint thinners

Automotive paints can be hazardous due to regulated metals used as color pigments. Paint thinners are used to "thin" the paint to a certain viscosity and are used for cleaning spray guns and delivery lines. Solvents such as toluene, methyl ethyl ketone, and xylene are commonly used in the automotive coating industry to promote faster cure time; however, such solvents can also make the thinner a "listed" hazardous waste. Waste paint thinner can also be a "characteristic" hazardous waste due to a low flash point and/or regulated metals content from the colorants used. Vehicle painting processes offer a variety of P2 options to reduce the amount and toxicity of wastes.

### P2 for waste paints and thinners

- Change to a high-volume, low-pressure spray (HVLV) delivery system to enhance transfer efficiency (amount of paint deposited on part) and reduce paint losses due to overspray and bounce back.
- Use high-solids coatings where possible to increase the amount of paint "build" with each pass of the gun.

- Train operators to paint more efficiently by improving their spray technique.
- Seek alternatives to paints with regulated metal pigments.
- Remove as much paint from the system as possible; don't add waste paint to waste thinner. Thinner will remain cleaner and last longer, and the cost of disposal is less for solvents with smaller amounts of sludge.
- Change to straight mineral spirits for cleaning; use a high-flash solvent with a two-stage cleaning system. When the first wash solvent gets too dirty to use, replace with the second-stage cleaner; replace second stage with clean solvent. Using a two-stage system will reduce the amount of solvent used.
- Recycle dirty paint thinner in a solvent still to recover usable solvent. A hazardous waste determination will need to be made on the still bottoms.

### Regulatory resources for waste paints and paint thinners

- KDHE's Spring 1999 Hazardous Waste Connection article: "Things You Should Know"  
<http://www.kdhe.state.ks.us/waste/hwcnews/spring99.pdf>



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