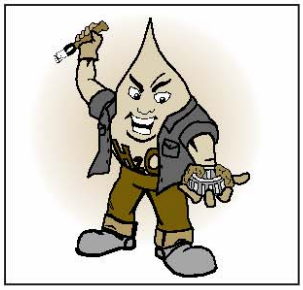
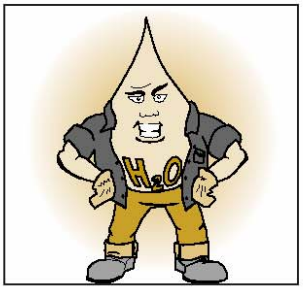
Pollution Prevention
Vehicle Service and Repair
Video Training Workbook

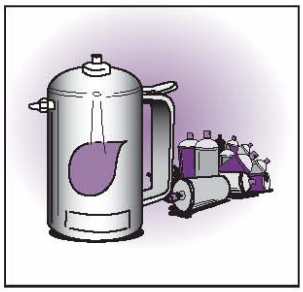
Best Environmental Practices for Auto Repair and Fleet Maintenance



Aqueous Parts Cleaning

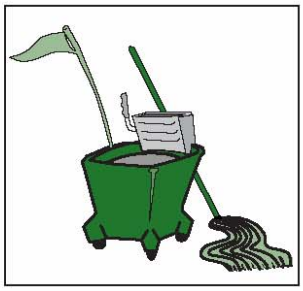


Aqueous Spray Cabinets



Refillable Spray Bottles

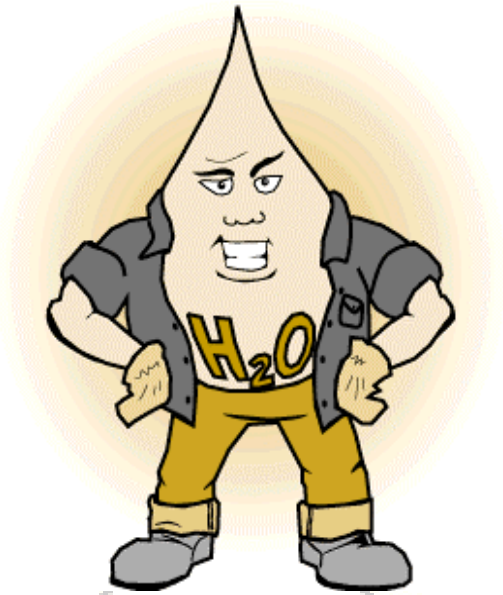
Spill Prevention Measures



4-Step Cleanup Method

Oil Life Extension Program

For Further Assistance refer to either the Pollution Prevention Toolkit Fact Sheets or call the Technical Support Group at 1(800) 700-5854.



Aqueous Parts Cleaning

Question 1

What are some of the benefits to using a microbial sink top instead of a conventional solvent sink top?

► **List at least three advantages:**

1. _____

_____

2. _____

_____

3. _____

_____

Aqueous Parts Cleaning

Answers to Question 1

1. **They Really Work!** Aqueous and Microbial Sink Top units clean parts differently, but can be just as effective as solvent sink tops. They are best suited for light-duty cleaning when parts need to be cleaned quickly then returned to a vehicle.

2. **No Toxic Side Effects.** Aqueous and microbial sink tops are safe.
   - Aqueous and microbial cleaning solutions do not produce harmful or toxic side effects if you inhale vapors.
   - In contrast to solvents that cause hands to become dry, crack, and peel, aqueous cleaners do not damage your skin.

3. **A Lot Less Hazardous Waste is Generated.** The only routine waste generated from the microbial sink top is the *solution filter*, which is only replaced every 4-6 weeks.
   - The *microbial solution* can last 1 to 2 years before it needs to be replaced.
   - The solution for a non-microbial aqueous sink top needs to be replaced more often depending on the amount of use.

4. **Perfect for Small Shops.** Aqueous sink tops are an ideal low-cost alternative for small shops.

For More Information:

» Check out the fact sheet, *Aqueous Parts Cleaning* in your Pollution Prevention Toolkit.
» For Aqueous Solution and Equipment distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Aqueous Parts Cleaning

Important Things to Understand

- **Keep the microbial sink top unit plugged in, even overnight**. If the solution gets **cold**, the **microbes will die**.
- Most sink top units have a built-in filter that cleans the aqueous solution whenever the pump is running.
- Aerosols could harm the microbes and make it difficult to manage the spent solution. **As a rule, never use aerosols near the sink area.**
- **Excessive oil will suffocate the microbes**. Use caution not to overload the sink top when cleaning parts excessively soiled with oil.
- Over time, solutions may change color but this **discoloration does not affect cleaning ability.** Change the solution only when performance declines.
- Change the filter every 4 to 6 weeks to keep the solution clean and help prevent sludge accumulation.
- Unless filters have been verified as non-hazardous through lab testing, **handle used sink top filters as hazardous waste**.
- Remember, do not discard used sink-top filters with the used oil filters.
- **Always handle spent solutions and sludge as hazardous waste.**
- Spent solutions, used oil and waste antifreeze should be kept separate.

❖ Never Dump Spent Solutions Into the Storm Drain ❖

For More Information:

» Check out the fact sheet, *Aqueous Parts Cleaning* in your Pollution Prevention Toolkit.
» For Aqueous Solution and Equipment distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Aqueous Spray Cabinets

Question 2

What are some of the benefits offered by spray cabinets?

► ***List at least three advantages:***

1. _____

2. _____

3. _____

Aqueous Spray Cabinets

Answers to Question 2

1. **Saves Time and Labor.** Since cleaning is automated, you are free to perform other tasks while parts are being cleaned in the spray cabinet.
   - In addition, spray cabinets can easily clean large parts or large quantities of smaller parts.

2. **High Level Cleaning Performance.** Superior cleaning is achieved, especially with heavily soiled parts and difficult-to-remove soils.

3. **No Solvent Residue.** Cleaned parts have no solvent residue that can be harmful to workers. Plus, solvent residue breaks down grease when bearings are repacked.

4. **Fast Drying.** Because parts are hot, they dry quickly when taken out of the spray cabinet and can be quickly returned to the vehicles.

   ✷ Be Careful ✷

   Don't Touch Cleaned Parts with Your Bare Hands

   Cleaning Solution is Heated to 160 – 190 ^{o}F.

5. **Less Hazardous Waste.** Skimmed oil and used filters from routine maintenance are the only hazardous wastes that need to be managed in between solution changes.
   - Skimmed oil should be managed with waste oil.
   - Unless filters have been verified as non-hazardous through lab testing, **handle used spray cabinet filters as hazardous waste.**
   - Remember, do not discard used spray cabinet filters with the used oil filters.
   - **Always handle spent solutions and sludge as hazardous waste.**

For More Information:

» Check out the fact sheet, *Aqueous Parts Cleaning* in your Pollution Prevention Toolkit.
» For Aqueous Parts Cleaners and Cleaning Solution distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Aqueous Spray Cabinets

Important Things to Understand

Aqueous solutions can work effectively for 3 to 6 months before needing to be replaced.

The Following Will Help Increase Solution Effectiveness:

- Skim oil from the aqueous solution to reduce the amount of oil residual left on parts. This should be done every 2 weeks to 2 months, depending on the amount of oil.
- Add chemicals to maintain cleaning solution strength. Vendors can help you with this.
- Filter the solution to decrease sludge accumulation.
- Over time, solutions may change color but this **discoloration does not affect cleaning ability.**
- Replace solution when cleaning performance diminishes and when the above measures are no longer effective.
- Solution requires replacement about 2 to 6 times a year.
- **Always handle spent solutions and sludge as hazardous waste.**

For More Information:

» Check out the fact sheet, *Aqueous Parts Cleaning* in your Pollution Prevention Toolkit.
» For Aqueous Parts Cleaners and Cleaning Solution distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
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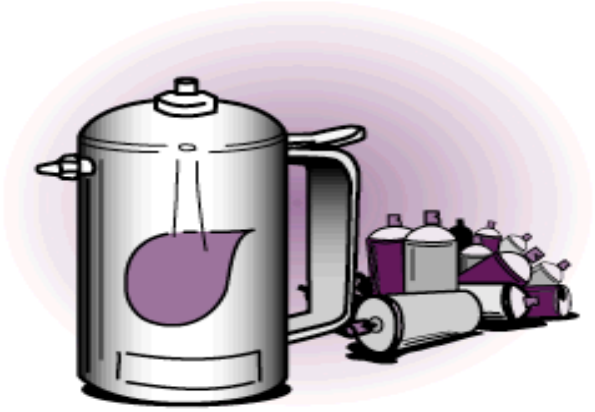

Refillable Spray Bottles

⣿ Question 3 ⣿

What are some of the things to remember when using refillable spray bottles?

► ***List at least 3 important things:***

1._____

2._____

3._____

Refillable Spray Bottles

Answers to Question 3

1. **Avoid Spills.** To avoid spills – use either a funnel or pump when refilling the bottles. *Fill bottles over a drip pan.*

2. **Use Compatible Refillable Spray Bottles.** Refillable spray bottles are made from various types of materials and finishes (aluminum, stainless steel, brass, steel and plastic).
   - Make sure the cleaner or product you are using is compatible with the spray bottle material. Don't use refillable plastic bottles for solvents or aluminum bottles for caustics.

3. **Pressurize Bottles**. Use shop air to pressurize the metal spray bottles to the manufacturer's specified limits.
   - Make sure your shop air supply has a water/moisture removal device – water can cause corrosion in steel refillable spray bottles.

4. **Use Down Time to Refill Bottles.** Use the time between jobs to top-off or refill your spray bottles

5. **Use Nozzle Extensions**. Nozzle extensions come in different shapes and lengths to get to those hard-to-reach areas.

6. **Store Cans in Toolboxes.** Spray bottles should be stored in chemical toolboxes when not in use.

✷ ***Make sure contents are clearly labeled on each spray bottle*** ✷

For More Information:

» Check out the fact sheet, *Refillable Spray Bottles* in your Pollution Prevention Toolkit.
» For Refillable Spray Bottles and Aqueous Cleaning Solution distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Refillable Spray Bottles

Important Things to Understand

- There are currently *no restrictions* on using aqueous cleaners in refillable spray bottles.
- Be sure to satisfy the fire safety requirements when using solvents in pressurized refillable spray bottles.
- Keep in mind that use of **solvents in refillable spray bottles** may not be permitted in your area.
- Check with your local air district or air quality authority first.

For More Information:

» Check out the fact sheet, *Refillable Spray Bottles* in your Pollution Prevention Toolkit.
» For Refillable Spray Bottles and Aqueous Cleaning Solution distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Spill Prevention Measures

Question 4

What Spill Prevention Measures Are In-Place at Your Shop?

1. _____
2. _____
3. _____

What Other Measures Could Be Easily Implemented?

1. _____
2. _____
3. _____

Keep Your Shop Clean and Safe

Spill Prevention Measures

Answers to Question 4

1. **Use Drip Pans.** Use stationary or roll-around drip pans during oil changes or during any operation involving transfer of products or waste.
   - Use drip pans when filling spray bottles or applying products with spray bottles.

2. **Minimize Spills.** Use sloped drum covers or funnel drum covers to catch spills that may occur during transfer operations. These covers minimize spills to the ground and save product.
   - Sloped and funnel drum covers can also be used to drain oil filters into a waste oil drum.

3. **Prevent Overfilling.** Use a waste oil caddy with a level indicator to help prevent overfilling.
   - A sight glass level indicator shows you the level of the waste fluid.

4. **Use Secondary Containment.** Store bulk product drums and waste drums on secondary containment pallets or in water troughs to ensure that any spills or leaks are caught before they hit the floor.
   - Inexpensive water troughs used for livestock can be purchased at your local feed store.

5. **Overhead Bulk Delivery**. Overhead bulk delivery systems allow jobs to be done quickly and further reduce spills. In addition, use drip pans while filling to prevent spills.

For More Information:

» Check out the fact sheet, *Floor Cleanup* your Pollution Prevention Toolkit.

» For Spill Prevention Equipment distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.

» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Spill Prevention Measures

Important Things to Understand

- Keep product and waste containers closed when not in use to prevent spills if accidentally knocked over.

- Inspect drums, troughs, and secondary containment units daily for leaks and keep them clean and dry.

- **Don't store incompatible materials in the same secondary containment. Label the contents of each container**.

For More Information:

» Check out the fact sheet, *Floor Cleanup* your Pollution Prevention Toolkit.

» For Spill Prevention Equipment distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.

» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

4-Step Cleanup Method

Question 5

What are the 4-Steps to this Cleanup Method?

1._____

2._____

3._____

4._____

☞ **Always "Stop if there's a Drop!"**

4-Step Cleanup Method

Answers to Question 5

Step 1 - Mop Up Oil. If a spill contains oil, clean it up first using a hydrophobic mop that only absorbs oil. Wring out the mop in a dedicated oil bucket. Then transfer the oil waste to an oil drum for recycling.

Step 2 - Mop Up Antifreeze. If the spill contains a significant amount of antifreeze, soak it up using a dedicated cloth mop. Wring out the mop in a dedicated antifreeze bucket. Then transfer the waste antifreeze to a waste coolant drum for recycling.

Step 3 - Dry the Surface. Use shop rags to soak up any residual liquid and dry the floor. *Do not saturate rags.* Then send the rags to an industrial laundry or dispose of them properly.

Step 4 - Final Cleaning. Only if necessary, mop the floor with a mild (non-caustic) detergent. It may be acceptable to dump the wash water down the shop sink or toilet, but check with your local sewage agency first.

❖ Never Dump Wash Water Down the Storm Drain ❖

For More Information:

» Check out the fact sheet, *Floor Cleanup* your Pollution Prevention Toolkit.
» For Floor Cleanup Product distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1(800) 700-5854.

4-Step Cleanup Method

Important Things to Understand

❖ Separate Your Spill Waste Whenever Possible ❖

- Keep dedicated mops and buckets nearby for spill cleanup just in case a larger spill occurs.
- A floor squeegee and dustpan is great for cleaning up spills from an epoxy-coated floor.
- Use absorbent materials, commonly known as kitty litter or grease sweep, sparingly – only for fuel or solvent spills or in emergency situations. Absorbent used to clean up a mixture of hazardous liquids should be disposed of as hazardous waste.
- Always carry shop rags in your pocket to wipe up small spills when they occur.
- **Never hose down your work area.** Hosing down floors creates contaminated wash water that can easily end up in the sewer, storm drain or oil/water separator.
- If you use a power washer to wash the floor, be sure to dispose of the wash water correctly. *Don't dump the wash water down the sewer or storm drain.*

Contaminated Water In Storm Drains is Harmful to Fish

And Could Affect Your Drinking Water.

For More Information:

» Check out the fact sheet, *Floor Cleanup* your Pollution Prevention Toolkit.
» For Floor Cleanup Product distributors, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1(800) 700-5854.

Oil Life Extension Program

Question 6

What are some of the steps necessary to successfully create an Oil Life Extension Program?

1._____

2._____

3._____

Oil Life Extension Program

Answers to Question 6

Gather Baseline Data. To establish a baseline collect oil samples from two consecutive oil changes. Document the following:

- Oil change intervals
- Vehicle driving conditions
- Vehicle age
- Brand and type of oil used
- Recent maintenance and recent repair work.

1. **Sample the Oil.** At regular intervals, sample oil during regularly scheduled maintenance activities. Install a sample port or collect samples through a hose inserted through the dipstick tube.
   - Collect the sample within 15 minutes of engine shut-off.

2. **Send All Oil Samples to an Oil-Testing Lab.** The lab should test for pH, viscosity and dielectric constant, and should check for wear metals and contaminants like antifreeze, fuel, solids and water.
   - On-site test kits can be used to test dielectric constant.

3. **Look Over the Results.** Review results to determine if test parameters are within acceptable limits, and how much longer oil life can be extended.
   - If the oil test results do not indicate any problems, increase the oil change interval by 15 to 25%.

For More Information:

» Check out the fact sheet, *Oil Life Extension* in your Pollution Prevention Toolkit to obtain valuable information on how you can begin your own program.
» For Diagnostic Equipment or to locate an Oil Testing Laboratory, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Oil Life Extension Program

Evaluating Test Results

Most testing labs or equipment vendors will provide contaminant thresholds or action levels for specific test parameters to help you decide when to change your oil.

The following applies to two common tests, the viscosity and dielectric constant tests:

- **Action is needed if viscosity increases more than 20%, or decreases more than 10%, from the baseline.**

- Use of on-site testing equipment can detect changes in the dielectric constant and help identify potential problems:
  - A moderate increase indicates the presence of contaminants such as dirt, acids, soot, and oxidation products.
  - An extreme increase indicates the presence of water, antifreeze, or metal particles
  - A moderate decrease indicates the presence of fuel.

- Testing labs can also help pinpoint engine wear problems based on the wear metals they detect.

If test results at the change interval are favorable, consider extending the change interval further. If the results are not favorable, reduce the change interval and repeat the testing.

For More Information:

» Check out the fact sheet, *Oil Life Extension* in your Pollution Prevention Toolkit to obtain valuable information on how you can begin your own program.
» For Diagnostic Equipment or to locate an Oil Testing Laboratory, visit our web site at: http://www.dtsc.ca.gov/PollutionPrevention/VSR. See the **DTSC Equipment and Supplies Directory** for listings and helpful information on the ***Vehicle Service and Repair Project***.
» For Further Assistance, Call the Technical Support Group at 1-(800) 700-5854.

Pollution Prevention

Vehicle Service and Repair

Best Environmental Practices for
Auto Repair and Fleet Maintenance

Fact Sheets

- ► **Profit through Prevention**
- ► **Aqueous Parts Cleaning**
- ► **Case Studies ~ Aqueous Parts Cleaning**
- ► **Aqueous Brake Washers**
- ► **Refillable Spray Bottles**
- ► **Oil Life Extension**
- ► **Reusable Oil Filters**
- ► **Floor Cleanup ~ *The 4-Step Cleanup Method***
- ► **Oil / Water Separators**
- ► **Antifreeze Recycling**
- ► **n-Hexane Use in Vehicle Repair**