

Managing Automotive Antifreeze

What is antifreeze?

Antifreeze is a material that, in automotive applications, is used to protect engines against overheating, freezing in low temperatures, and corrosion. While antifreeze has many other uses and can contain either ethylene glycol or propylene glycol as a primary active ingredient, the antifreeze most commonly used in automobiles contains ethylene glycol and additives that inhibit corrosion.

Ethylene glycol is a toxic material with a sweet taste that is attractive to children and pets. Ingestion of enough ethylene glycol can cause respiratory failure, kidney failure, coma, and even death. Consequently, the proper management of spent ethylene glycol-based antifreeze is particularly important. Propylene glycol is generally not associated with adverse health effects and sometimes is even used as a food additive.

Automotive antifreeze, which is usually diluted with an equal amount of water, breaks down over time, forming acids that can corrode a vehicle's cooling system. During use, antifreeze can also become contaminated with trace amounts of fuel, metals and grit. Consequently, the replacement of spent antifreeze should be part of routine maintenance for all vehicles.

How is spent ethylene glycol-based antifreeze regulated?

Businesses: Due to the toxicity of ethylene glycol and the contaminants introduced through use, spent ethylene glycol-based antifreeze generated by Vermont businesses is regulated as hazardous waste under the Vermont Hazardous Waste Management Regulations (VHWMR). As a hazardous waste, spent ethylene glycol-based antifreeze can **either** be:

- **Managed as hazardous waste** identified by the VT08 hazardous waste code that applies to "waste ethylene glycol and solutions containing greater than 700 parts per million of ethylene glycol;" **or**
- **Recycled** according to the ethylene glycol recycling exemption provided in section 7-204(i) of VHWMR.

Households: Although household-generated wastes are not subject to hazardous waste regulations, it is illegal to release spent antifreeze (or any other waste) onto the ground, or into waterways (e.g., storm drains, ditches, streams, lakes, etc.) or septic systems. In addition, all liquid wastes are banned from landfill disposal in Vermont. Household-generated antifreeze should be managed through the household hazardous waste collection program in your area. Contact your local solid waste management district for information.

What requirements must be met if spent ethylene glycol is managed as hazardous waste?

Although most businesses choose to recycle their antifreeze, the requirements that apply to businesses that manage spent ethylene glycol as hazardous waste depend on the types and total quantity of all hazardous waste that the business generates per month. For more information about hazardous waste management requirements, refer to the "Conditionally Exempt Generator Handbook" which is available on-line at:

http://www.anr.state.vt.us/dec/wastediv/rcra/pubs/ceg_hndbk.pdf

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What conditions must be met to satisfy the ethylene glycol recycling exemption?

In order to be exempt from regulation as hazardous waste, spent ethylene glycol antifreeze must be recycled for reuse either on- or off-site. In addition:

- Prior to recycling, the containers holding the spent antifreeze solutions on-site must:
 - ✓ Remain closed except when adding or removing spent material;
 - ✓ Be in good condition (i.e., no rusting, structural defects, etc.);
 - ✓ Be stored on an impervious surface, within a structure that sheds rain and snow; and
 - ✓ Be marked with words that identify the contents, like: "USED ANTIFREEZE TO BE RECYCLED."

AND

- Any residue resulting from on-site recycling must be managed as hazardous waste.

Recycling methods include filtration, distillation, and ion exchange. Distillation and ion exchange restore antifreeze to the highest level of purity (for more information on antifreeze recycling technology contact the Environmental Assistance Office).

Is a hazardous waste manifest required to ship spent antifreeze for off-site recycling?

No. A manifest is not required when shipping an exempt waste. Nonetheless, some transporters may still require, for their own purposes, that a manifest be used when shipping antifreeze to an off-site recycling facility. In such cases, the business should use the VT99 waste code to identify the spent antifreeze as exempt (non-taxable) waste.

Is propylene glycol-based antifreeze regulated under the VHWMR?

No. Unless the business has reason to believe that the propylene glycol-based antifreeze has become sufficiently contaminated with metals or fuel as to exceed hazardous waste limits, it is not subject to regulation as hazardous waste.

Best Management Practices

- If the vehicle manufacturer's warranty allows, substitute less toxic propylene glycol for ethylene glycol, or use recycled antifreeze.
- Test antifreeze for properties such as corrosion inhibition and freeze protection before replacing; only replace antifreeze when necessary.
- Investigate "extended life" antifreeze products. Manufacturers claim that these products last up to five years or 100,000 miles in automobile engines, and up to 300,000 miles in heavy-duty diesel engines (with the addition of an extender).
- Businesses managing spent antifreeze should contract with a commercial recycling service to recycle spent antifreeze on- or off-site.
- Businesses should manage all vehicle fluid wastes (e.g., antifreeze, oil, transmission fluid, gas) separately.

For more information contact:

Vermont Department of Environmental Conservation:

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103 South Main Street, West Bldg.
Waterbury VT 05671-0404
802-241-3888

Environmental Assistance Office
103 South Main Street, Cannery Bldg.
Waterbury VT 05671-4911
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