

How is antifreeze regulated? In Michigan, antifreeze is regulated by the Department of Environmental Quality (DEQ) under several parts of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). These parts and the regulating DEQ Divisions include:

- **Part 31 Water Resources Protection** (permitting of discharges into state waters – Surface Water Quality and Waste Management Divisions);
- **Part 55 Air Pollution Control** (permitting of some recycling units and installing storage or transfer operations of volatile organic compounds of noncarcinogenic liquids – Air Quality Division);
- **Part 111 Hazardous Waste Management** (managing it if it is a hazardous waste – Waste Management Division);
- **Part 121 Liquid Industrial Wastes** (managing it if it is not a hazardous waste – Waste Management Division);
- **Part 201 Environmental Response** (reporting releases and cleaning up any contamination – Environmental Response Division);
- **Part 211 Underground Storage Tank Regulations** (storing ethylene glycol in regulated underground tanks – Storage Tank Division);
- **Part 213 Leaking Underground Storage Tanks** (reporting releases and cleaning up any contamination from regulated tanks – Storage Tank Division).

In addition to the above DEQ regulations, other requirements that may apply to antifreeze include:

- **US Environmental Protection Agency (EPA)**
 - ❖ *Resource Conservation and Recovery Act (RCRA)* [40 CFR Parts 260-299] (managing hazardous waste, and storing ethylene glycol in underground storage tanks. See www.epa.gov/epaoswer/osw).
 - ❖ *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* [40 CFR Part 302] (reporting ethylene glycol releases under federal regulations since it is listed as a hazardous substance in Table 302.4. See www.epa.gov/epahome/laws.htm).
 - ❖ *SARA Title III* [40 CFR Parts 370 and 372] (notifying under Section 312 [Tier II form] if more than 10,000 pounds of ethylene glycol is kept on site at any one time and reporting under Section 313 [Form R] if the company meets the reportable threshold for ethylene glycol, has an applicable SIC code, and has 10 or more full time employees or equivalent of 20,000 hours/year. See www.deq.state.mi.us/ead/sara).
- **US Department of Transportation** [49 CFR Parts 100-199] (using containers, shipping labels and papers, placarding, etc. See hazmat.dot.gov).
- **Michigan Department of Consumer and Industry Services** [29 CFR Part 1910.1200] (training and awareness requirements under the Hazardous Communication Standard [Right-to-Know]. See www.cis.state.mi.us/bsr/division.htm).
- **Local requirements**

The remainder of this document will describe the regulations overseen by the DEQ Waste Management Division — Parts 111, 121, and 31. Reliance on information from this document is not usable as a defense in any enforcement action or litigation. Refer to the regulations or discuss your requirements and questions with the regulating agency staff.

What is antifreeze and why should I be concerned? Antifreeze is a mixture of water, coolant (usually ethylene glycol or propylene glycol), and additives. Antifreeze is used to protect engines against overheating and corrosion and also from freezing in low temperatures. It is also used as a deicing agent for airplanes. Ethylene glycol is most commonly used.

Health Risk Even small amounts of ethylene glycol can cause health problems if swallowed by people or pets. The lethal adult human dose is less than 7 tablespoons. Children can be seriously harmed when they ingest as little as two tablespoons.

Health effects range from minor skin irritation to coma, respiratory failure and even death

It is estimated that between 11.6 and 22.5 million gallons of antifreeze are replaced every two years in Michigan.

without treatment. Propylene glycol has a lower toxicity rating than ethylene glycol and is considered to be a safer alternative. Reported health effects usually involve children who have ingested large amounts.

Environmental Risk Environmental contamination can occur when antifreeze is improperly disposed of or handled. Although microorganisms in the environment will eventually break down virgin antifreeze, many of the contaminants found in used antifreeze do not break down. Contaminants include copper, lead, zinc, and 1-4 dioxane. Heavy metals, such as copper and lead, may cause problems at wastewater treatment plants. These metals might keep a plant from meeting its permit discharge requirements. In addition, the sludge created at the treatment plant might exceed maximum heavy metal content requirements and would require the sludge to be handled as a hazardous waste. Spent antifreeze poured onto the ground or into septic systems may eventually contaminate the groundwater. Spent antifreeze poured into storm drains, ditches, streams, lakes, etc., will contaminate surface water. When large quantities of ethylene glycol biodegrade, they may deplete the levels of dissolved oxygen in the water, killing aquatic organisms. Improper disposal may also result in drinking water supplies becoming contaminated.

How is antifreeze managed? Businesses are responsible for its proper management including disposal. Train employees about safe handling practices and spill and emergency response. Direct any questions about spill reporting and response requirements to the DEQ Environmental Response Division District Office staff. If you have a regulated underground storage tank, direct those questions to the DEQ Storage Tank Division District Office.

Determine if antifreeze removed from radiators or hoses is reusable or a waste.

- If it is a usable product, keep it in a closed, labeled container and reuse it.
- If it is a waste, then recycle or properly dispose of the used antifreeze.

Is testing of waste antifreeze required? A business is required to determine if its spent antifreeze, even the kind labeled "environmentally friendly," is a hazardous waste. A generator can determine this by either testing it [using the Toxicity Characteristic Leaching Procedure (TCLP) or using a total metals analysis as a screening test] or by knowledge of the waste [using material safety data sheets or other documentation]. Depending on your company's situation, your waste hauler or recycler may have information available about your antifreeze characteristics. You must keep the test results or other documentation indicating its characteristics at least 3 years after they

were last generated. If it is a hazardous waste, then the specific management requirements will depend on your generator status – large quantity generator (LQG), small quantity generator (SQG), or conditionally exempt small quantity generator (CESQG).

Hazardous Waste Generator Status Categories

In ONE month, the total amount of ALL nonacute hazardous waste is generated at the following volumes:

LQG: more than 1,000 kg (2,200 pounds) [and/or 1 kg (2.2 pounds) or more of acutely and severely toxic hazardous waste is generated.]

SQG: 100 kg (220 pounds) to less than 1,000 kg (2,200 pounds). Accumulation never exceeds 6,000 kg (13,200 pounds).

CESQG: less than 100 kg (220 pounds). Accumulation never exceeds 1,000 kg (2,200 pounds).

There are also storage time limits.

Waste antifreeze is not a listed waste, but it may exhibit hazardous characteristics due to having:

- Accumulated heavy metals [e.g., lead levels may reach a TCLP concentration of 5.0 mg/L or greater (D008 waste). Spent antifreeze is likely to be hazardous waste if it was from an older vehicle that has been sitting for years and has picked up enough metals.]
- Traces of fuel [e.g., may make it flammable (D001 waste). Spent antifreeze may be hazardous waste if it has been mixed with gasoline and it has a flashpoint less than 140°F or it contains benzene TCLP concentrations of 0.5 mg/L or greater that would make it have a toxicity hazardous waste characteristic (D018).]
- Other contaminants from engine parts at regulated toxicity levels.
- Broken down over time and had acids form [e.g., may make it a corrosive hazardous waste (D002) if the pH is less than or equal to 2.0.]

How is waste antifreeze stored? The specific accumulation requirements that generators must meet depend on if the spent antifreeze is a hazardous or liquid industrial waste. The specific hazardous waste requirements depend on the generator's status.

- ✓ Store the different spent antifreeze chemicals separately to aid in recycling. Some recycling companies allow spent ethylene glycol and propylene glycol to be mixed together – check with your recycler. Do NOT mix spent antifreeze with used oil or any other waste.

- ✓ Store in a container in good condition with no leaks or defects. It must be compatible with the antifreeze stored in it. Keep the container closed at all times except when emptying or filling.
- ✓ Label the container with “Spent Antifreeze” or “Used Antifreeze” if the used antifreeze is being managed as a liquid industrial waste or if it was generated by a CESQG. The use of “spent or used antifreeze” is recommended for containers holding spent antifreeze that is hazardous waste as an aid for your employees, but it is not required. Containers holding antifreeze considered hazardous waste must meet the following labeling requirements:
 - If the container is in an accumulation area, the label has to have the words “hazardous waste” along with the hazardous waste code and the accumulation start date on it. That’s the date waste was first put into the container.
 - If the container is being used as a “satellite container,” it must be labeled with the words “hazardous waste” and the waste code **or** the common name like “used antifreeze”. A satellite container is one used to accumulate up to 55 gallons of hazardous waste, or one quart of acutely hazardous waste, at the point of generation. There is no limit on how long the satellite container can be kept at its location as long as it is used on a regular basis, the operator has control of the process generating the waste, and the satellite accumulation does not exceed the 55-gallon limit.
- ✓ Store in a well-ventilated area.
- ✓ Provide secondary containment of the storage area. This is recommended for all storage areas and in some situations may be required.
- ✓ Store it no longer than the allowable time period. There is no time limit if the spent antifreeze is a liquid industrial waste or if it was generated by a CESQG. If the spent antifreeze is a hazardous waste, then the following time limits apply:
 - SQGs may accumulate up to 180 days. If the distance to the treatment, storage, and disposal facility is over 200 miles, then it can be accumulated up to 270 days.
 - LQGs may accumulate up to 90 days.
- ✓ Inspect the containers holding hazardous waste for signs of corrosion and leaks. Tanks have other specific requirements.
 - CESQGs have no specified inspection time schedule.
 - SQGs and LQGs must inspect containers weekly. LQGs are required to keep written inspection records for at least 3 years. It is recommended other generators keep records.
 - Regular inspections are recommended for containers holding liquid industrial waste.

It is recommended you also:

- ✓ Use dedicated equipment such as drain pans, funnels, and buckets to reduce the risk of contamination from other hazardous waste.
- ✓ Do not use a container that is lined with paint, resin, or other materials that could further contaminate the used antifreeze.
- ✓ Do NOT store antifreeze in old food or beverage containers for safety reasons.

If you are a homeowner and maintain your own vehicles, check if any local businesses will accept your spent antifreeze. Or check if a household hazardous waste collection program is available in your area that accepts antifreeze. Do NOT pour it into a septic system or a storm drain or onto the ground.

How is antifreeze recycled? You can recycle antifreeze at your facility or have it reclaimed by a commercial recycler. Options include:



- Purchasing or leasing recycling equipment and operating it at your site. Consider using a closed loop system that connects directly to the radiator. It filters the antifreeze and then puts it directly back into the vehicle. You could eliminate managing antifreeze as a waste with this type of system.
- Contracting with a mobile service that comes to your business and recycles the antifreeze on-site.
- Hiring a permitted and registered transporter and having them haul the spent antifreeze to a recycling facility. A waste manifest must be used with the shipment.

DEQ has a *Michigan Recycled Materials Market Directory* available that includes antifreeze recyclers. Download a copy off the Internet at www.deq.state.mi.us/ead/recycle or call 800-662-9278 for a copy. EPA has an equipment vendor list at es.epa.gov/vendors.

Recycling may save you money by:

- 1. Reducing the amount of virgin antifreeze you need to purchase; and**
- 2. Reducing the amount of waste material requiring disposal.**

Recycling methods include filtration, distillation, and ion exchange. The filtration method removes impurities, is relatively inexpensive, and easy to use. The EPA, however, has conducted some tests that indicate the corrosion resistant properties of filtered antifreeze are not restored through the filtration technique. Distillation and ion exchange methods result in a more thoroughly reclaimed product. Usually it is necessary to add chemicals to recycled antifreeze. Some vehicle manufacturers now allow recycled antifreeze to be used under their warranties.

What are other requirements for generators operating recycling equipment on-site?

- ✓ Do not need to obtain a permit from the Waste Management Division.
 - A permit and license are required if storing and/or recycling spent antifreeze considered to be hazardous waste and it was generated at an off-site location. Contact the Waste Management Division District Office.
- ✓ May need to obtain an air permit if the equipment discharges air emissions. Contact the Air Quality Division District Office for information.
- ✓ Must determine if sludge and waste filters derived from the recycling process are a hazardous waste. If the waste is hazardous, then it must be managed according to Part 111. If the residue is not a hazardous waste and does not contain liquids, it may be disposed of in a licensed solid waste landfill.

How else can antifreeze be disposed of?

Antifreeze determined to be a hazardous waste can be disposed of off-site by the following methods:

1. Hire a permitted and registered hazardous waste transporter and have the waste taken to a licensed treatment, storage, or disposal facility (TSDF).
 - ✓ Use a manifest to track the waste shipment.
 - Many haulers provide manifest copies. If they do not, call 800-662-9278 or 517-373-1217 for information how to order. Complete the manifest and distribute the copies in accordance with the instructions on the manifest. Keep your copy and submit the DEQ copy to the Waste Management Division within 10 days after the end of the month in which the shipment occurred. Make sure to get a copy back from the TSDF within the allowable time frame. A timetable flow chart and tracking log are available on the Internet at www.deq.state.mi.us/wmd or get a copy by calling 800-662-9278.

- ✓ Use all of the applicable hazardous waste codes on the manifest.
2. Haul your own generated antifreeze to a TSDF and follow the manifest requirements. If you haul 55 gallons or less of waste, you do not need to manifest the load if you do following:
 - ✓ Keep a record of the source and quantity of waste and where it was taken for at least 3 years.
 - ✓ Obtain a signature from the designated facility acknowledging receipt of the waste and give them a copy of the record.
 3. Discharge it to a municipal wastewater treatment plant **with the sewer authority's prior permission**. Each plant has its own treatment capabilities so some will not accept antifreeze. It is recommended that you get written permission, but is not required by state law.

Antifreeze that is not a hazardous waste can be disposed of by either of the following methods:

1. Wash the spent antifreeze down the drain **IF** the drain is connected to a municipal wastewater treatment facility and **IF prior permission has been obtained from the sewer authority**.
 - Ø Used antifreeze **cannot** be discharged to storm drains or onto the ground under any circumstance.
 - Ø Used antifreeze **must never** be discharged into a drain that leads to a septic system.
2. Hire a permitted and registered liquid industrial waste transporter. The spent antifreeze can be delivered to a recycling operation, TSDF, or to a municipal waste water treatment plant that allows disposal of the antifreeze into its system.
 - ✓ Use a manifest to track the waste shipment (see bullets under hiring hazardous waste transporter).
 - ✓ Use waste code 030L on the manifest.

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