

ON-SITE AEROSOL CAN DRUM TOP RECYCLING SYSTEMS

Guidance

Aerosol cans are a common waste generated by most businesses. Aerosol cans contain a product and propellant under pressure. The product is released from the aerosol can (the container) in the form of a spray or mist when the nozzle is pressed to apply the product. As the product is used, the propellant is also used. Examples of products commonly dispensed using aerosol cans include:

- maintenance products (degreasers and cleansers)
- beauty products (hair sprays and perfumes)
- cooking products (vegetable sprays)
- surface coating products (paints and varnishes)
- personal care products (bug sprays and sunscreens)
- pharmaceutical products (inhalers) and
- pesticides (ant or wasp sprays)



If a site routinely generates large volumes of aerosol cans, it may be cost effective to recycle the aerosol cans for their scrap metal value and manage any accumulated liquids separately. Typically aerosol cans are made of steel or aluminum. Although the Michigan Department of Environment, Great Lakes, and Energy (EGLE) does not consider empty aerosol cans a reactive hazardous waste, some states do and most solid waste vendors require special waste approvals for aerosols due to the explosion hazard they present when compacted. To avoid special waste costs, recycling may be a cost effective option.

This guidance summarizes the environmental regulations that apply to on-site drum top puncturing systems used to recycle aerosol cans. Additional requirements apply to puncturing and recycling aerosol cans discarded by another site. For questions about recycling off-site generated aerosol cans, please contact the Environmental Assistance Center at 800-662-9278. For questions about the safety requirements related to recycling aerosol cans, please contact the Michigan Occupational Safety and Health Administration at 517-284-7750. Often aerosol cans contain ignitable and/or combustible products. When recycling aerosol cans that contain ignitable or combustible liquids, put precautions in place to prevent ignition and coordinate with local fire officials to ensure the local fire code is met. Measures to ensure only compatible materials are managed in an aerosol can recycling program are also key to an effective program that safely reduces costs and environmental liabilities.

What is an Empty Aerosol Can?

Most aerosols cans do not contain products which become an acutely toxic hazardous waste when discarded. Therefore, most aerosol cans are empty when the pressure in the container approaches atmospheric pressure. To ensure an aerosol can that held a non-acute hazardous waste is considered empty under the hazardous waste and liquid industrial by-product regulations, listen for audible liquids and check to see if the can is clogged. If the container is clogged and has audible liquids, accumulate the non-empty aerosol cans to meet the regulations that apply based on the type of waste and the site's generator status.

Aerosol Can Recycling System Air Pollution Permitting Regulations

On-site aerosol can recycling does not require an air use permit under the Michigan [air pollution control rules](#). Rule 285(hh) of the Michigan air pollution control rules exempts the on-site puncturing of miscellaneous hand-held aerosol cans and Rule 287(b) exempts the on-site puncturing of surface coating hand-held aerosol cans.

Aerosol Can Recycling System Waste Licensing Regulations

Most on-site aerosol can recycling systems fit onto a drum as pictured above. When puncturing aerosol cans, any container used to collect liquids from puncturing the aerosol cans is considered both a waste *treatment* container and a waste *accumulation* container. The device used to puncture the aerosol cans is considered a waste *treatment* container because any remaining content from the aerosol cans is commingled in the container resulting in a new waste stream that exhibits different characteristics and has a different composition than the original waste streams. Given the container is also used to accumulate the remaining contents of the aerosol cans, the container is also considered an *accumulation* container. Consequently, when operating an aerosol can recycling system, both the hazardous waste generator accumulation and treatment licensing exemption requirements must be met. Beyond accumulating commingled liquids, these systems also typically capture any unused propellant on carbon filters used to control volatile emissions and minimize exposure hazards from use of the device. As a result, use of a recycling system results in two newly generated waste streams that must be [characterized](#), the carbon adsorption filters and the accumulated liquids. On-site generator accumulation and treatment of hazardous waste is exempt from hazardous waste licensing when performed in accordance with the provisions of Rules 205, 306 and 503 of the Michigan [hazardous waste rules](#) and the [statutory requirements for managing liquid industrial by-product](#) summarized in this guidance.

Characterizing Aerosol Can Waste

When characterizing aerosol can waste, only non-empty aerosol cans must be characterized and counted when calculating a site's generator status. The weight of the non-empty aerosol can is included in the generator status determination, but the weight of the container used to accumulate the non-empty aerosol cans (i.e. the drum or bin used to collect intact aerosol cans) is not.

When characterizing non-empty aerosol can waste, the contents of each aerosol can must be reviewed. As such, the Safety Data Sheet (SDS) for each product is important for making the waste characterization determination. If the product in the aerosol can contains hazardous constituent(s) listed in Table 1 (see page 3), the waste from the aerosol can is a characteristic toxic hazardous waste for the constituent(s) present (D004 through D043). Only when the waste is tested to prove the regulatory limits in the Table 1 are not exceeded is sufficient information available to conclude the waste is not hazardous for that constituent. If the SDS shows the product has a flashpoint of 140°F or less, the waste is an ignitable hazardous waste (D001). If the product has a pH of greater than or equal to 12.5 or less than or equal to 2, the waste is a corrosive hazardous waste (D002). If the product is reactive under the U.S. Department of Transportation standards, the waste is a reactive hazardous waste (D003). If the product in the discarded non-empty aerosol can is not ignitable, toxic, corrosive or reactive, the waste from the aerosol can is a liquid industrial by-product. Note that if less than 220 pounds of non-acute hazardous waste is generated site-wide on a monthly basis, the site never accumulates greater than 2,200 pounds of non-acute hazardous waste at any one time, and the site lawfully disposes of accumulated hazardous wastes, then the non-empty aerosol cans may be managed to meet the liquid industrial by-product regulations under the [conditionally exempt small quantity generator](#) (CESQG) exemption from hazardous waste regulation.

Characterizing Aerosol Can Recycling System Waste

When using an on-site aerosol can recycling system to process empty and non-empty aerosol cans, the most practical way to inventory the amount of hazardous waste generated monthly is to puncture all cans generated throughout the month, then inventory the amount of hazardous waste in the treatment/accumulation container at the end of the month. In this case, a ledger can be maintained at the drum, which records the change in the waste volume in the drum at the end of each month. This will allow the volume to be converted to a weight and included in records documenting the monthly hazardous waste generator status determination. When characterizing the recycling system waste, like characterizing non-empty aerosol cans, the SDS for all of the aerosol cans processed in the recycling system are reviewed, including those from empty aerosol cans that are treated/recycled. Assign all codes that would be assigned for the individual products treated in the system, unless test data prove a code does not apply. Periodically the carbon filters on the recycling system will also require replacement and need to be characterized. Discarded filters should be assigned all of the hazardous waste codes that apply to the accumulated residual aerosol can liquids unless testing or knowledge can be used to demonstrate the waste does not exhibit the hazardous waste characteristic(s).

Accumulating Aerosol Can Waste

Knowing the regulatory status of discarded aerosol cans and aerosol can recycling system waste is key to accumulating the waste streams in a manner that meets the waste accumulation regulations. The applicable requirements vary based on the type of waste, location of the container, and the site's generator status. The accumulation requirements for the aerosol can collection container may be different than the accumulation requirements for the aerosol can recycling container, depending on how the aerosol can collection and recycling process is established. For example, a [satellite container](#) that is at or near the point of generation and under the operators' control may be used to accumulate aerosol cans in the maintenance shop. In that case, the aerosol cans would need to be immediately processed in the aerosol can recycling system once moved to the treatment/accumulation container because moving a waste from one satellite accumulation area to a second satellite accumulation area is strictly prohibited under the hazardous waste regulations for small quantity and large quantity hazardous waste generators. Typically, a container that accumulates only empty aerosol cans is considered a solid waste or [scrap metal accumulation container](#) and has no specific waste accumulation requirements. See the [summary of hazardous waste generator requirements guidance](#) for details on the accumulations requirements that must be met for hazardous waste generator accumulation containers. Note too that large quantity generators with waste having a volatile organic content of 500 parts per million by weight must meet additional hazardous waste container air emission requirements for containers with a capacity of 26 gallons or more.

Treating/Commingling Aerosol Can Waste

To be exempt from the requirement to obtain a hazardous waste license for treatment, the aerosol can recycling system must meet the on-site generator treatment exemption found under Rule 503(1)(i) of the [hazardous waste rules](#). Although liquid industrial by-product and CESQG hazardous waste treatment may have less stringent requirements, to advocate implementation of best management practices, only the hazardous waste treatment exemption requirements are highlighted in this guidance. To meet the hazardous waste treatment exemption, an on-site aerosol can recycling system must meet the following requirements *in addition to any [accumulation container requirements](#)*:

1. The treatment container must:
 - Be in good condition, compatible with the waste and closed, except when it is necessary to add, or remove the waste.
 - Be located in an area where it is protected, from weather, fire, physical damage, and vandals.
 - Be managed to prevent rupture, leaking, or release to the environment
 - If holding ignitable or reactive hazardous waste, it must be located at least 50 feet from the facility's property line.
 - Be located in an area with secondary containment.

2. The treatment container secondary containment must:
 - Have a base that is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.
 - Be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids.
 - Have sufficient capacity to contain 10% of the volume of all containers or all of the volume of the largest container, whichever is greater.
 - Be operated to prevent run-on into the containment system.
 - Be managed to remove spilled or leaked waste.
 - Where applicable, be managed to remove accumulated precipitation in a timely manner as is necessary to prevent overflow of the collection system.

3. The treatment containers and secondary containment area must be inspected weekly, looking for leaking containers, for deterioration of containers, and to verify the integrity and capacity of the containment system, and the weekly inspections must be documented.

Table 1. Characteristic Hazardous Wastes for Toxicity

(if waste meets or exceeds the listed concentration when tested using the toxicity characteristic leaching procedure test)

U.S. EPA Hazardous Waste Number	Chemical Abstract Services Number	Material	Extract Concentration from TCLP analysis in milligrams per liter
D004	7440-38-2	Arsenic	5.0
D005	7440-39-3	Barium	100.0
D018	71-43-2	Benzene	0.5
D006	7440-43-9	Cadmium	1.0
D019	56-23-5	Carbon tetrachloride	0.5
D020	57-74-9	Chlordane	0.03
D021	108-90-7	Chlorobenzene	100.0
D022	67-66-3	Chloroform	6.0
D007	7440-47-3	Chromium	5.0
D023	95-48-7	o-Cresol	200.0**
D024	108-39-4	m-Cresol	200.0**
D025	106-44-5	p-Cresol	200.0**
D026	-----	Cresol	200.0**
D016	94-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid)	10.0
D027	106-46-7	1,4-Dichlorobenzene	7.5
D028	107-06-2	1,2-Dichloroethane	0.5
D029	75-35-4	1,1-Dichloroethylene	0.7
D030	121-14-2	2,4-Dinitrotoluene	0.13*
D012	72-20-8	Endrin (1,2,3,4,10,10-hexachloro-1,7-Epoxy-1,4,4a,5,6,7,8,8a octahydro-1,4-endo, endo-5,8-dimenthano naphthalene)	0.02
D031	76-44-8	Heptachlor (and its Epoxide)	0.008
D032	118-74-1	Hexachlorobenzene	0.13*
D033	87-68-3	Hexachlorobutadiene	0.5
D034	67-72-1	Hexachloroethane	3.0
D008	7439-92-1	Lead	5.0

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U.S. EPA Hazardous Waste Number	Chemical Abstract Services Number	Material	Extract Concentration from TCLP analysis in milligrams per liter
D013	58-89-9	Lindane (1,2,3,4,5,6-hexachlorocyclo-hexane, gamma isomer)	0.4
D009	7439-97-6	Mercury	0.2
D014	72-43-5	Methoxychlor (1,1,1-trichloro-2,2-bis(p-methoxyphenyl)ethane)	10.0
D035	78-93-3	Methyl ethyl ketone	200.0
D036	98-95-3	Nitrobenzene	2.0
D037	87-86-5	Pentachlorophenol	100.0
D038	110-86-1	Pyridine	5.0*
D010	7782-49-2	Selenium	1.0
D011	7440-22-4	Silver	5.0
D039	127-18-4	Tetrachloroethylene (also called perchloroethylene)	0.7
D015	8001-35-2	Toxaphene (C ₁₀ H ₁₀ Cl ₁₈ , Technical chlorinated camphene, 67-69 percent chlorine)	0.5
D040	79-01-6	Trichloroethylene	0.5
D041	95-95-4	2,4,5-Trichlorophenol	400.0
D042	88-06-2	2,4,6-Trichlorophenol	2.0
D017	93-72-1	2,4,5 TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	1.0
D043	75-01-4	Vinyl chloride	0.2

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