



TREATMENT BY GENERATOR

Treatment Specific Guidance

Polymerization

Fact Sheet 14-04-002

February 2014

This document is for generators interested in treating their waste resins by on-site polymerization, in accumulation tanks or containers. Dangerous waste generators who comply with these standards and the standards in the Technical Information Memorandum (TIM) #96-412, [Treatment by Generator](#), will also meet the requirements of the [Dangerous Waste Regulations](#), Chapter 173-303 WAC¹. This document is intended only as guidance for the treatment requirements of the [Dangerous Waste Regulations](#), Chapter 173-303 WAC. Ecology can require a permit or different management requirements if it determines the treatment process poses a threat to public health or the environment. Small quantity generators should refer to Ecology's fact sheet #14-04-004 [Small Quantity Generators Treating Dangerous Waste](#) for information applicable to their operations.

Description and Definition

The plastic products industry uses plastic resins and gelcoats combined with catalysts to make products like boats, surfboards, and shower stalls. Service industries such as auto body repair also use these materials. These manufacturing processes generate waste resins that designate as an ignitable (D001) dangerous waste. When waste resins such as polyester are reacted with a catalyst like methyl ethyl ketone peroxide (MEKP), they harden through the polymerization process and no longer exhibit the ignitability characteristic.

Polymerization: a technique by which liquid resin monomers² are reacted to form a solid polymer chain. Plastic resin wastes can be treated by reacting them with a catalyst agent to produce a chemically stable hard plastic that is no longer an ignitable dangerous waste.

Applicability

Polymerization is appropriate for treating ignitable resin wastes originally intended for the commercial manufacture of plastics. For example, waste polyester resins can be mixed with MEKP to produce a chemically stable hard plastic. Other ignitable monomers may also be treated by polymerization.

Treatment by polymerization is limited to only those reactions initiated by a polymerizing component or catalyst. Polymerization initiated by other methods such as a thermal process does not qualify as polymerization treatment by generator.

Some manufacturing processes generate waste resins already containing enough catalyst to complete polymerization. The mixture hardens into a nonhazardous, solid waste without additional catalyst. In

¹ Washington Administrative Code

² Molecules that may bind chemically to other molecules to form a polymer.

these situations, the hardening process is not considered treatment by generator. Also, when excess resins are used or reused to make valuable marketable products, it is not considered treatment. For example, Ecology allows use or reuse of excess resins and ground still bottoms³ as filler putty used in boat building.

If Ecology determines that the treatment process poses a threat to public health or the environment, we may require the generator to obtain a treatment permit. If the waste is being treated to meet Land Disposal Restriction (LDR) standards, please see “Other Regulatory Requirements,” below.

This document is intended solely as guidance and only addresses the requirements of the *Dangerous Waste Regulations*. The generator is still ultimately responsible for complying with all applicable federal, state, and local requirements relating to on-site waste management. Based on specific site circumstances, Ecology officials may require a generator to manage their waste differently than as specified in this guidance. Ecology may also revise this fact sheet at any time.

Criteria

The following criteria apply to treatment by generator polymerization in addition to the Treatment by Generator guidance in TIM #96-412:

1. Polymerization must make the ignitable waste resin into an inert material that no longer exhibits any characteristic of dangerous waste. Sufficient amounts of catalyst must be mixed in for complete polymerization to occur. Resulting waste must be a solid, inert mass. Semi-solid materials would not achieve treatment as intended by polymerization.
2. Polymerization is restricted only to waste resin materials that can polymerize. Other types of solid waste cannot be added into the waste resin.
3. Treatment process wastewaters (generated from a cooling step) and solidified resins must be fully designated prior to disposal. Some resin additives may contain halogenated organic compounds used for flame retardant properties, causing the waste to designate for state persistence.

Other Regulatory Requirements

Detailed information about the requirements of this guidance can be found in TIM #96-412, along with information on appropriate permit by rule and LDR requirements. Generators must comply with the *Dangerous Waste Regulations*, Chapter 173-303 WAC, including proper designation of waste(s), accumulation standards, handling and labeling standards, reporting standards, spills and discharge requirements, etc. In addition, the generator must comply with all other applicable federal, state, and local regulations as well.

³ Residues left over from the process of recovering spent solvents in a distillation unit.

Case Example

A yacht manufacturer generates and treats excess polyester resin from the boat-building process. Each batch treated is limited to five gallons or less to adequately disperse the heat generated from the chemical reaction. They place the resin in a container within their permitted paint booth and add a hardening agent to it. The resulting solid mass is broken apart to verify that complete polymerization has occurred and there are no free liquids. The hardened material may be disposed as solid waste if determined not to be a dangerous waste. They note the type of waste, date, and amount treated on the treatment log. The treated waste is counted as generated dangerous waste toward determining their generator status and included in their Dangerous Waste Annual Report.

Ecology Assistance

For assistance, please contact a hazardous waste specialist at one of the following Ecology offices:

Southwest Regional Office, 360-407-6300

300 Desmond Drive, Lacey, WA 98503-1274

Northwest Regional Office, 425-649-7000

3190 - 160th Ave. SE, Bellevue, WA 98008-5452

Central Regional Office, 509-575-2490

15 West Yakima Ave, Suite 200, Yakima, WA 98902-3452

Eastern Regional Office, 509-329-3400

4601 N Monroe, Spokane, WA 99205-1295

Or visit Ecology's website at

www.ecy.wa.gov/programs/hwtr/manage_waste/treatment_by_generator.html

To request this document in a format for the visually impaired, call the Hazardous Waste and Toxics Reduction Program at 360-407-6700. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.