



Boat Manufacturing – A “Hot” Industry
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Topics

- Chemicals used in fiberglass boat manufacturing
- Types of applications used
- Hazardous waste generation
- Waste determination
- Proper hazardous waste management
- Treatment of hazardous waste
 - Solvent Distillation
 - “Kicking off” old resins, gelcoats, etc.



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Other Fiberglass Applications/Two-part Coatings

- Other Fiberglass Applications
 - Pool/spa manufacturing
 - Storage tanks
- Two-part coatings “Part A/Part B”



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Chemicals Used in Fiberglass Boat Manufacturing



Resin

Epoxy

Gelcoat

Catalyst

Solvent

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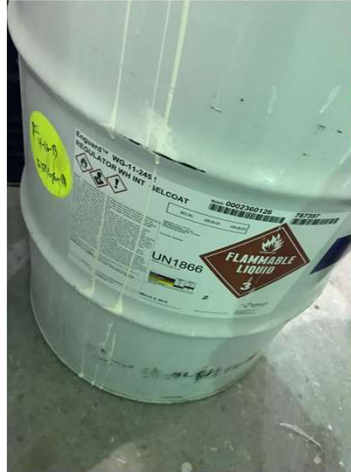


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Chemicals Used in Manufacturing

- Resins/Epoxy
- Gelcoats
- Catalysts
- Solvent (for cleaning)
 - Acetone



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Types of Applications in Fiberglass Boat Manufacturing

- Hand-Rolled Fiberglass
- Chopped Fiberglass
- Infusion Molding
- Foam
- Drilling/Sanding



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Molds



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From Mold to Boat



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Applying Gelcoat



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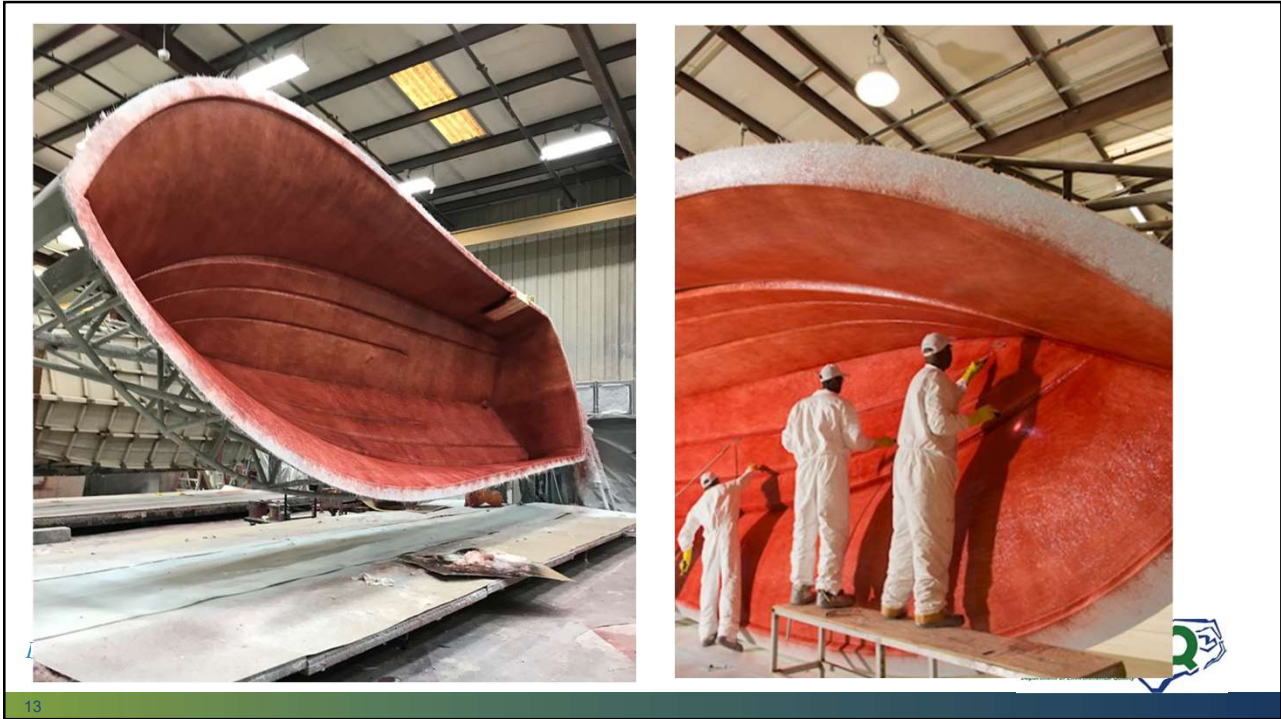
Hand-Laying Fiberglass Application



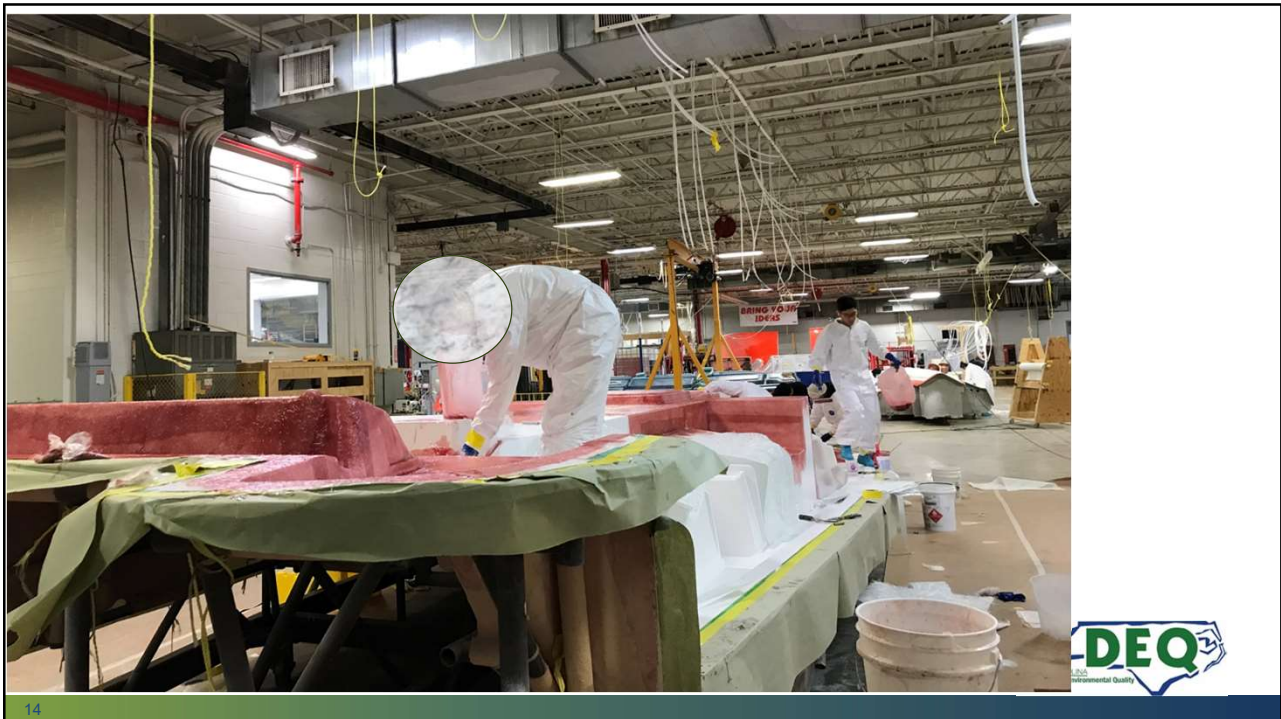
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Chopped Fiberglass Application



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Resin Infusion/Vacuum Infusion



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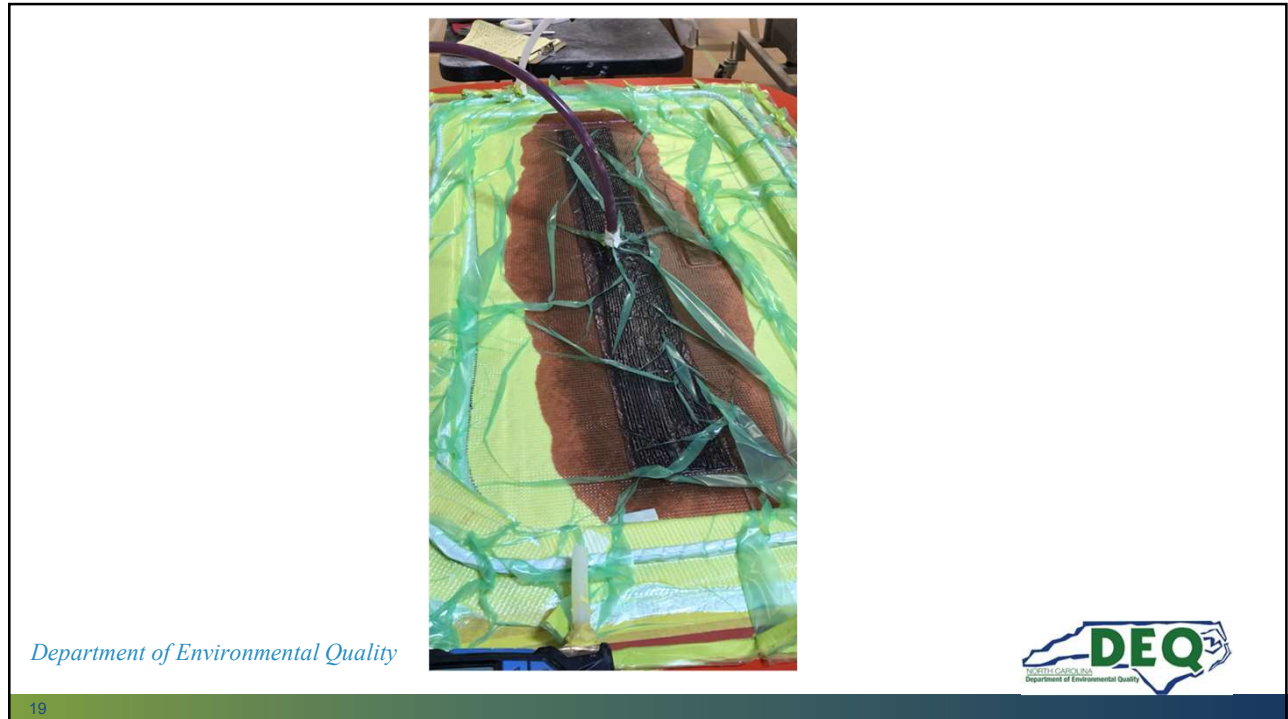


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Foam Core



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Foam Spraying



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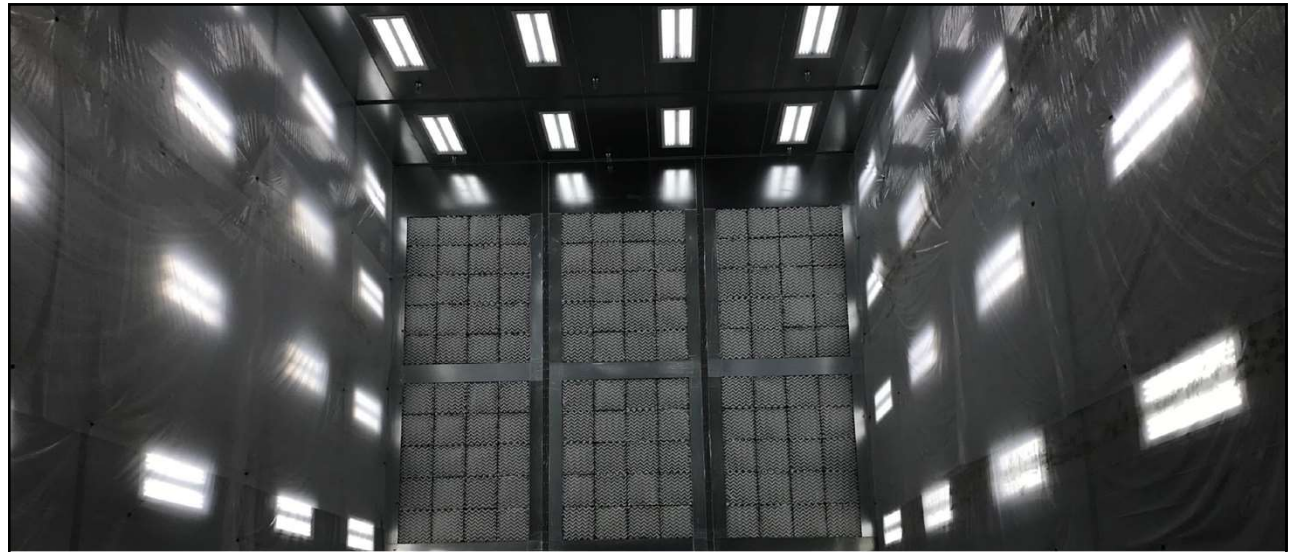
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“Sink Test”



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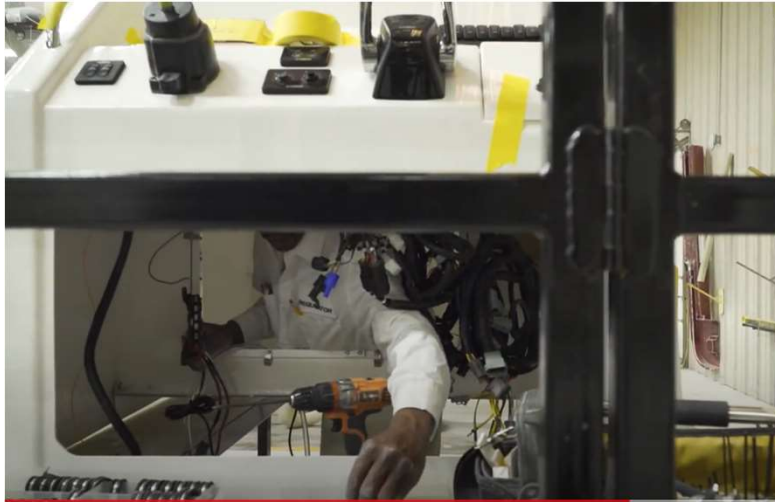
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Paint Booth

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Drilling/Wiring/Etc.



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Hazardous Waste Generation

- Spent solvent
- Leftover resin/catalyst “hot pot”
- Expired gelcoat/resin “kicking-off”



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Point of Generation (POG)/Waste Determination



Waste Determination (40 CFR 262.11):

- The waste determination **MUST BE MADE**:
 - At the point of waste generation;
 - **BEFORE** any dilution, mixing, OR OTHER ALTERATION of the waste occurs.
- Mixed resin/catalyst that is still liquid at the POG will be an ignitable hazardous waste.
- Must be managed accordingly in hazardous waste containers.



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“Hot Pots”



- Another hazardous waste determination can be made after a waste alters.
 - Completely catalyzed hot pots are non-haz
 - The “Hot Pot” waste must be counted towards the facility’s generator classification



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Proper Accumulation of "Hot Pots/Hot Batch/Hot Drum"



Must be in closed containers managed in accordance with the facility's generator status



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Container Management
40 CFR 262.15 (SAA) and 262.16 (SQG) & 262.17 (LQG)(CAA)

- Must be clearly marked "Hazardous Waste" (SAA/CAA);
- with an indication of the hazards of the contents (SAA/CAA); and
- the date upon which each 90/180/270-day accumulation period begins (CAA) "accumulation start date"


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Container Management


40 CFR 262.15 (SAA) and 262.16 (SQG) & 262.17 (LQG)(CAA)

SQG
 LQG



Both SAA and CAA containers:

- Must be in good condition
- Must be compatible with contents
- Must be closed (unless actively adding or removing waste)
 - To minimize emissions of volatile wastes, to help protect ignitable or reactive wastes from sources of ignition or reaction...
 - RCRA Online document RO 14826 has excellent guidance from EPA on closed containers for SAA, CAA, liquid, solid waste, etc.:
<https://rcrapublic.epa.gov/files/14826.pdf>



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Container Management



40 CFR 262.15 (SAA) and 262.16 (SQG) & 262.17 (LQG)(CAA)

SQG
 LQG

Both SAA and CAA containers:

- Waste must be kept inside the container
- Clean up spills immediately




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Hazard Indication Guide for Marking HW Containers

Methods to indicate the hazards of the contents of a container include, but are not limited to the following

The applicable hazardous waste characteristic(s) marked on the container or on a label on the container	Ignitable, Corrosive, Reactive, Toxic
Department of Transportation labels or placards at 49 CFR part 172 subpart E	
Hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 CFR 1910.1200	
Chemical hazard label consistent with the National Fire Protection Association code 704.	

SQG
 LQG

- “Newer” requirement from the Hazardous Waste Generator Improvements Rule (2018)
- All HW containers (SAA and CAA) must be marked with an indication of the hazards of the contents of the container.



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Container Issues



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Permit-Exempt Options for HW Treatment

- Treatment in wastewater treatment units
- Treatment in 90/180/270-day accumulation units
- Recycling
- Elementary neutralization
- Treatment in totally enclosed treatment facilities
- Adding absorbents to waste
- Immediate response
- Burning small quantities of wastes in onsite units



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*Solvent
Distillation*

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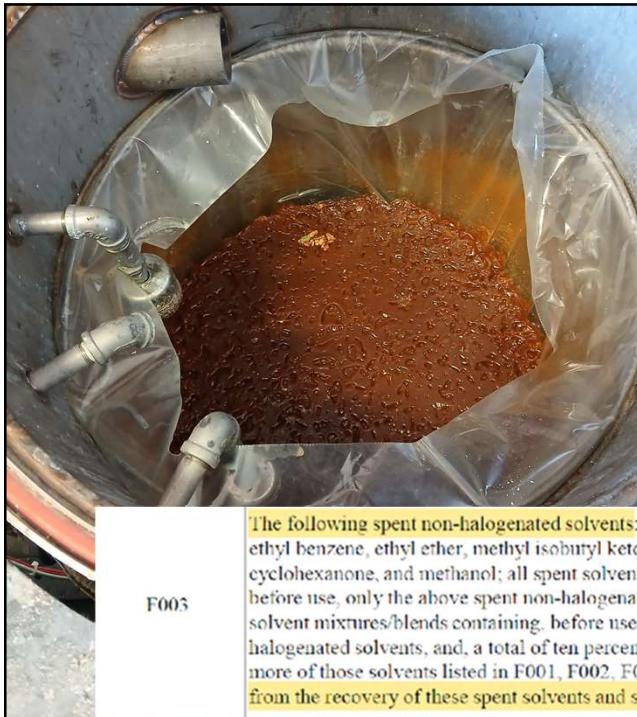


Recycling a Spent Solvent by Distillation

- Count the spent solvent if it accumulates before distillation (treatment).
- Containers accumulating before treatment are subject to hazardous waste regulations (40 CFR 262).
- The recycling unit is not subject to RCRA §261.6(c)(1).



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Waste Determination on Distillation Bottoms

- The distillation bottom is a new point of waste generation.
- If the spent solvent was counted, do not count the distillation bottom (if HW).

F003

The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures

(U)*

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Hazardous Waste Treatment: “Kicking-off”

- Two-part definition (40 CFR 260.10):

- *It is a process designed to change the physical, chemical, or biological character or composition of a hazardous waste; and*
- *To render the waste less hazardous; safer to transport; and/or amendable for storage or reduced in volume.*



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Hazardous Waste Treatment

- Must be in compliance with 40 CFR 262.16 (SQGs) or 262.17 (LQGs)
 - That means a VSQG must comply with SQG standards to treat hazardous waste in a 180/270-day container
- Must be done in a central accumulation area
- Containers must be properly closed; this container is not adequately closed for a CAA container.
- The boat industry may struggle to meet the closed container requirement during polymerization.



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Hazardous Waste Treatment

- Must meet Land Disposal Restriction notifications (40 CFR 268)
- LDR requirements attach at the POG of a hazardous waste

Treatment Standards for Hazardous Wastes

[Note: NA means not applicable]

Waste code	Waste description and treatment/regulatory subcategory ¹	Regulated hazardous constituent		Wastewaters	Nonwastewaters
		Common name	CAS ² No.	Concentration ³ in mg/L; or technology code ⁴	Concentration ⁵ in mg/kg unless noted as "mg/L TCLP"; or technology code ⁴
D001 ⁹	Ignitable Characteristic Wastes, except for the §261.21(a)(1) High TOC Subcategory 13.4.2	NA	NA	DEACT and meet §268.48 standards ⁸ ; or RORGS; or CMBST	DEACT and meet §268.48 standards ⁸ ; or RORGS; or CMBST
	High TOC Ignitable Characteristic Liquids Subcategory based on 40 CFR 261.21(a)(1) —Greater than or equal to 10% total organic carbon. (Note: This subcategory consists of nonwastewaters only)	NA	NA	NA	RORGS; CMBST; or POLYM



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Land Disposal Restrictions One-Time Notification/Certification

1. Generator information: Name <u>Boat Manufacturer</u> Address <u>123 Main St</u> <u>Greenville NC</u> EPA ID No. <u>NCRXXXXXXXXX</u>		2. Receiving facility information (if applicable): Name <u>My Landfill</u> Address <u>123 Center St</u> <u>Ahoskie, NC</u> EPA ID No. <u>N/A</u> Manifest No. <u>N/A</u>			
3. Waste description at point of generation:					
Line item	Waste description	Hazardous waste code(s)	LDR Subcategory	WW/ NWW	Underlying hazardous constituents [§268.2(i)] ¹
1	Out of date/expired gel coat, Core bond	D001	High TOC Ignitable	NWW	Not required for POLYM
2	Out of date/expired poly bond	D001	High TOC Ignitable	NWW	Not required for POLYM
3	Fiberglass bonding process	D001	High TOC Ignitable	NWW	Not required for POLYM
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4. Waste disposition:					
Line item	Subtitle C exclusion subsequent to point of generation (if applicable)	Current disposition of waste	§268.45, Table 1 technology used to treat debris (if applicable)	Date shipped (if applicable)	
1	N/A	N/A	N/A	N/A	



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Hazardous Waste Treatment

- Must develop and follow a Waste Analysis Plan (WAP)

40 CFR 268.7(a)(5)

5. Waste Analysis Process (POLYM Treatment)

- a. Weigh product with the scales in Lamination flammable storage. Document weight on the Hazardous Waste Kick-Off Tracker sheet located outside the Facilities Manager office.
- b. Once containers are in the kickoff area no other product can be added to the container for disposal
- c. The kickoff process begins with a 2% ratio of catalyst (MEKP Organic Peroxide Type D Liquid) to the total amount of product listed on orange tag of container.
- d. Stir until the liquid is completely one solid color to analyze proper waste disposition - proper waste disposition is one color.
- e. Place closed hinged lid on container once stir is complete.
- f. Facilities personnel will properly dispose of the container after the hardening process and a cool down period of two hours. Time may vary according to quantities. Once material has cooled down, the material is no longer considered hazardous waste and will be disposed to the landfill.



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Summary

- Fiberglass manufacturing generates hazardous waste
 - Spent acetone
 - Leftover or expired gelcoat/resins
- Need to make a proper waste determination and count waste towards generator status
- Need to accumulate hazardous waste in appropriate containers
- Will often treat their hazardous waste
 - Will need to meet SQG standards, if a VSQG
 - Meet LDR requirements
 - Need Waste Analysis Plan (WAP)



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Questions?



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