

REINFORCED PLASTICS AND BOAT MANUFACTURING MACT STANDARDS DEVELOPMENT



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Outline

- Legal requirements and background
- Status of Reinforced Plastics and Boat Manufacturing MACT development
- EPA's approach for developing MACT for existing open molding sources
- MACT standards being considered (as of September 1998) for existing open molding sources in the Reinforced Plastics and Boat Manufacturing Categories

Legal Requirements and Background

Legal Requirements

- MACT = “maximum achievable control technology.” This term is commonly used to describe the standards mandated by section 112 of the Clean Air Act (CAA)
- CAA contains a list of hazardous air pollutants (HAP) e.g., styrene, methyl methacrylate, others
- CAA requires EPA to list industry categories of major sources of HAP (major: potential to emit 10 tons per year of a single HAP or 25 of a combination of HAP) and develop MACT standards for them
- Reinforced Plastics Composites Production and Boat Manufacturing are among the major source categories listed

Standards Development

- CAA prescribes the minimum level of stringency of the standard, denoted as the “MACT floor”
- For existing sources:
 - the MACT floor is the average of the best performing 12 percent of the existing sources if there are 30 or more sources in the category or subcategory
 - the MACT floor is the average of the best performing 5 sources if there are less than 30 sources in the category or subcategory
 - the average of the best performing sources can be the mean or the median
- Subcategories can be based on classes, types, and sizes of sources

Standards Development

- Different subcategories can have different floors -- cannot allow sources to average across subcategories
- MACT floor for new sources is the level of emission control that is achieved in practice by the best controlled similar source

Timing

- These MACT standards are due in the year 2000 (proposal is usually a year before rule is final)
- Compliance date established by rule, but generally can be no more than 3 years after rule is final

Status of MACT Standards Development

- Still in pre-proposal rule development phase
- Lots of communication and discussion of issues with the CFA, SPI/CI and NMMA
- MACT floors have been calculated
- Cost data to determine economic impacts have been collected and costs are being computed
- EPA Website for coatings and composites rule development is:
www.epa.gov/ttn/uatw/coat/coat.html

Status of MACT Standards Subcategories for Reinforced Plastics

- For Reinforced Plastics, the subcategories currently being considered are:
 - **open molding**
 - **closed molding**
 - **polymer casting**
 - **pultrusion**
 - **continuous lamination/casting**
 - **SMC manufacturing**
 - **equipment cleaning**
 - **mixing of HAP-containing materials**
 - **storage of HAP-containing materials**

Status of MACT Standards Emission Points for Boat Manufacturing

- For Boat Manufacturing, the emission points being analyzed are:
 - **open molding**
 - **carpet and fabric adhesives**
 - **wood coating systems**
 - **bottom coating systems**
 - **topside hull and deck coating systems**
 - **mold sealing and release agents**
 - **mold cleaning**
 - **equipment cleaning (painting and composites equipment)**
 - **mixing of HAP-containing materials**
 - **storage of HAP-containing materials**

EPA's Approach for Developing MACT for Existing Open Molding Sources

- Currently, the open molding subcategory has been broken out into process/product groupings, for which individual MACT floors have been established
- Latest approach to determine MACT floors is the use of a “point value” system involving averaging
- This type of an approach was suggested by reinforced plastics industry representatives in September 1997
- While the “point value” concept is the same for both Boat and Reinforced Plastics MACT, the process/product groupings are different and the data sets are different

The Open Molding Product/Process Grouping Currently Being Considered For Reinforced Plastics Are:

- Mechanical resin operations (e.g., spray guns that atomize, flow coaters, pressure-fed rollers)
 - corrosion
 - non corrosion filled
 - non corrosion unfilled
- Manual resin operations (e.g., bucket-and-brush, bucket-and-tool)
 - corrosion
 - non corrosion
- Filament winding/centrifugal casting
 - corrosion
 - non corrosion
- Gel coat operations
 - tooling
 - clear
 - pigmented

The Open Molding Product/Process Grouping Currently Being Considered For Boat Manufacturing Are:

- Resin operations (e.g., spray guns that atomize, flow coaters, pressure-fed rollers, bucket-and-brush)
 - production resin
 - tooling resin

- Gel coat operations
 - tooling
 - clear
 - pigmented
 - basecoats

What is a Point Value System?

- It is a method to combine specific emission reduction techniques into a numerical standard
- The point value determines the extent to which emission reduction techniques are employed & their combined effectiveness
- A point value limit is not an emission limit
- A MACT point value limit is determined for each product/process grouping within the open molding subcategory
- Facilities that have more than one product/process grouping can average to meet a weighted average point value limit.

Question:

How do I know if I am meeting the point value limit(s) in the MACT standard?

Answer:

Plug in your HAP content, application method and other emission reduction techniques into the MACT Model

Model consists of equations for:

- atomized resin
- non-atomized resin
- filament winding/centrifugal casting
- gel coat

Model will contain methods to incorporate:

- vapor suppressed resins (VSR)
- vacuum bagging
- add-on control

The emission reduction techniques being considered
in the model are:

- lower HAP resins and gel coats
 - non atomized resin application technology
 - vapor suppressed resins (VSR)
 - vacuum bagging (immediately after resin application)
 - add-on control device
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- You may need to do more than one of the above to meet the limits

 - We are planning to incorporate a procedure into the rule which will allow you to use other enforceable emission reduction techniques which are not addressed by the point value system

Point Value System Summary

- Each product/process grouping will have a MACT point value limit
- Use MACT model to determine if your emission reduction techniques meet the point value limits
- Facility has the option to meet a weighted average limit for all of its product/process groupings on a time-averaged basis (12 months rolling average)

MACT Standards Being Considered for Existing Open Molding Sources for Reinforced Plastics (NOT BOAT)

What are the MACT point value limits and some corresponding potential compliance options for the open molding process/product groupings?

The following notes apply to the compliance options listed:

- All % HAP limits are in terms of % by weight and are based on the HAP content of the neat resin and any added HAP (filler not included)
- VSR effectiveness is assumed to be 35% except for filled resins where it is assumed to be 0. For MACT compliance purposes a VSR effectiveness test needs to be conducted. Therefore, HAP contents presented in compliance options with VSR are approximate.
- Vacuum bagging effectiveness is assumed to be 45%. This will be further investigated. Therefore, HAP contents presented in compliance options with vacuum bagging could change.

Mechanical Resin Operations

– non corrosion unfilled

point value = 90 pounds of HAP/ton of resin used

Potential compliance options :

36.0% HAP and non-atomized or

28.1% HAP and atomized or

33.1% HAP and atomized with VSR or

43.6% HAP and non-atomized with VSR or

35.3% HAP and atomized with vacuum bagging or

46.9% HAP and non-atomized with vacuum bagging

Mechanical Resin Operations (continued)

- non corrosion filled

point value = 160 pounds of HAP/ton of resin used

Some compliance options that will meet the above point value:

35.0% HAP and atomized or

44.0% HAP and atomized with vacuum bagging

depending on VSR effectiveness for filled resins, there may also be a higher HAP resin option with the use of VSR

Mechanical Resin Operations (concluded)

– Corrosion

point value = 160 pounds of HAP/ton of resin used

Potential compliance options:

46.4% HAP and non-atomized or

35.0% HAP and atomized or

41.3% HAP and atomized with VSR or

56.3% HAP and non-atomized with VSR or

44.0% HAP and atomized with vacuum
bagging or

60.5% HAP and non-atomized with vacuum
bagging

Manual Resin Operations

- non corrosion

point value = 71 pounds of HAP/ton of resin used

Potential compliance options:

32.3% HAP or

39.1% HAP with VSR or

42.1% HAP with vacuum bagging

- corrosion

point value = 85 pounds of HAP/ton of resin used

Potential compliance options:

35.0% HAP or

42.4% HAP with VSR or

45.6% HAP with vacuum bagging

Filament Winding/Centrifugal Casting

- non corrosion

point value = 130 pounds of HAP/ton of resin used

Potential compliance options:

35.0% HAP or

48.8% HAP with VSR

- corrosion

point value = 148 pounds of HAP/ton of resin used

Potential compliance options:

38.7% HAP or

54.0% HAP with VSR

Gel Coating

- clear production

point value = 518 pounds of HAP/ton of gel coat used

Compliance option: 44.0% HAP

- pigmented production

point value = 274 pounds of HAP/ton of gel coat used

Compliance option: 31.2% HAP

- tooling

point value = 431 pounds of HAP/ton of gel coat used

Compliance option: 39.8% HAP

Reinforced plastics MACT standard will also address ancillary emission points

POTENTIAL REQUIREMENTS

- **Cleaning:** cleaning materials contain no HAP
- **Mixing** of HAP-containing materials: mixers greater than a certain size are to be closed or covered during mixing (except when materials are added or removed from the vessel) such that there are no visible gaps and there is no active venting
- **Storage** of HAP-containing materials: containers greater than a certain size are to be covered (except when materials are added or removed from the vessel)

MACT Standards Being Considered for Existing Open Molding Sources for Boat Manufacturing

What are the MACT point value limits and some corresponding potential compliance options for open molding?

Note: we are considering subcategorizing by facility size.

The following is for small & medium sized facilities

Boat Manufacturing Resin Operations

– Production resin

point value = 85 pounds of HAP/ton of resin used

Some compliance options that will meet the above point value:

35.0% HAP and non-atomized or

27.5% HAP and atomized or

32.4% HAP and atomized with VSR or

42.5% HAP and non-atomized with VSR or

34.5% HAP and atomized with vacuum bagging or

45.8% HAP and non-atomized with vacuum bagging

Boat Manufacturing Resin Operations (continued)

– tooling

point value = 107 pounds of HAP/ton of resin used

Potential Compliance Options:

38.7% HAP and non-atomized or

30.0% HAP and atomized or

35.4% HAP and atomized with VSR or

47.1% HAP and non-atomized with VSR or

37.7% HAP and atomized with vacuum
bagging or

50.7% HAP and non-atomized with vacuum
bagging

Boat Manufacturing Gel Coating

- clear production

point value = 551 pounds of HAP/ton of gel coat used

Compliance option: 45.5% HAP

- pigmented production

point value = 328 pounds of HAP/ton of gel coat used

Compliance option: 34.4% HAP

- tooling

point value = 430 pounds of HAP/ton of gel coat used

Compliance option: 39.8% HAP

- basecoats

point value = 155 pounds of HAP/ton of gel coat used

Compliance option: 29.1% HAP

Summary

- Open Molding approach presented for existing sources
- Still working with data -- numbers presented here are from September 1998
- Other subcategories/emission points addressed by Reinforced Plastics and Boat Manufacturing Standards
- Working with trade associations on issues raised
- Aiming to propose by the end of 1999
- Check out our website