

Guidance for Complying with EPA's MACT Standard for Composites Manufacturing

Revised October 27, 2005

This Guidance is intended to serve as a short introduction to the MACT standard for composites manufacturing. Owners and managers of composites manufacturing companies are *strongly encouraged* to read and understand the official EPA NESHAP (MACT standard) codified at 40 CFR Part 63 Subpart WWWW.

More information and the rule itself are available from:

- www.acmanet.org/members/ga/mact.cfm
- www.epa.gov/ttn/atw/rpc/rpcpg.html

A. Introduction

On April 21, 2003, EPA published new control standards for air emissions from composites manufacturing plants in the Federal Register. On August 25, 2005, EPA published a Federal Register notice making certain corrections and modifications to the rule.

These “maximum achievable control technology” (MACT) standards apply to all composites manufacturing plants with emissions of 10 tons per year (tpy) or more. The standards for existing plants and most new plants will require use of low-emitting resins, application equipment and/or work practices to reduce emissions. Some new plants with emissions over 100 tpy will have to use add-on control systems.

B. What is MACT?

When Congress amended the Clean Air Act in 1990, it directed EPA to list categories of *sources* that emit any of 189 *hazardous air pollutants*. The list of HAP established by Congress included styrene, methyl methacrylate, and methylene chloride, and in 1992 EPA listed Reinforced Plastics Composites Production as a category of sources emitting HAP.

Congress also told EPA to establish control requirements for each listed category of HAP sources. For each category, the requirements were to be based on what EPA determined was the *maximum achievable control technology*.

MACT Facts

For existing major sources, MACT **compliance is required by April 21, 2006**.

One spray gun represents enough production capacity to make a facility a major source and subject to MACT. Some smaller composite manufacturers will be exempt from MACT, but only if they have federally enforceable operating limits in state-issued air permits.

The Clean Air Act requires major sources to **comply with MACT on time** even if their state or local permitting authorities are late in issuing permits or developing state MACT programs.

The CAA **does not allow** state and local air pollution authorities to waive, lessen or delay MACT requirements.

Violations of the CAA can result in federal **felony charges** against owners and managers, and **fining of up to \$25,000** per violation per day.

The most important document for facilities required to comply with MACT is their **Title V operating permit**, which should clearly specify the applicable MACT requirements, including recordkeeping and reporting. The second most important document is their detailed **MACT compliance plan**.

MACT for open molding does not require the use of low-HAP resin or gel coat or low-emitting application technologies. MACT for open molding is an **emission limit** that can be achieved through combinations of low-HAP resin or gel coat, low-emitting application technologies, vapor suppressants, covered cure, and add-on controls.

There are no MACT requirements for **RTM and cast polymer operations**. However, there are requirements for co-located gel coating, mixing, resin storage and cleaning operations.

The successful use of **averaging** to meet the MACT emission limits for open molding and pultrusion will depend on rigorous production planning.

Congress further told EPA that MACT for *new sources* could be no less stringent than the level of control achieved by the single best controlled similar source, and for *existing sources* MACT could be no less stringent than the level of control achieved by the average of the best controlled 12% of similar sources. These minimum stringency levels for new and existing sources are called the *floors*.

EPA promulgates MACT requirements in the form of National Emission Standards for Hazardous Air Pollutants. The NESHAP for Reinforced Plastics Composites Production was promulgated and then modified in Federal Register notices published on April 21, 2003 and August 25, 2005.

The composites NESHAP is codified as Subpart WWWW, of Part 63, of Title 40, of the Code of Federal Regulations. Official references to the composites MACT rule will often take the form of *40 CFR Part 63 Subpart WWWW*.

C. Who has to comply with MACT?

Any reinforced plastics composites production operation located at a *major source* must comply with the composites production NESHAP.¹ A major source is a facility with the potential to emit of 10 tons per year of any single HAP, or 25 tpy or more of any combination of HAP.² Major sources of HAP are required to have *Title V operating permits* from their states.

For purposes of the MACT rule, a reinforced plastic composites production facility is one in which reinforced and/or non-reinforced plastic composites products or molding compounds are manufactured using thermoset resins and/or gel coats that contain styrene.

Operations making boat hulls and decks and/or making molds for making hulls and decks are required to comply with the boat building NESHAP (40 CFR Part 63 Subpart VVVV) instead of the composites production NESHAP. Guidance for plants making both boat and non-boat composites products is provided at 40 CFR 63.5787.

Research and development operations, plants that only repair composites products, and plants that use less than 1.2 tpy resin and gel coat are not required to comply with the composites NESHAP. See 40 CFR 63.5785. Certain other exemptions are provided in 40 CFR 63.5790(c) and (d).

D. When is MACT required?

New sources constructed after August 2, 2002, must comply on startup.

Existing sources must comply by April 21, 2006.

The NESHAP allows certain open molding, centrifugal casting and pultrusion operations to comply by “averaging” the emissions among their various regulated activities. Sources that average must show compliance on a twelve-month rolling average basis. Sources using averaging to demonstrate compliance with emission limits must start collecting data on April 21, 2006 and must demonstrate compliance 12 month later.

After their compliance date, sources must notify EPA of their compliance status twice annually.

E. New Source vs. Existing Source

A composites production facility is a *new source* if its construction commenced after August 2, 2001 (the publication date for the proposed rule), and if no other composites production operations existed at that site. 40 CFR 63.5795(a). A source “commenced construction” before August 2, 2001 if before that date it had either (i) entered into contracts for the construction of the facility that could not be cancelled without significant loss or (ii) it had actually begun a continuous program of on-site construction.

All composites production operations subject to the rule that are not new sources are considered *existing sources*. 40 CFR 63.5795(b).

¹ In most cases, state or local air pollution control authorities have been delegated the authority for enforcing MACT and permitting requirements. However, these state and local authorities may not waive, lessen or delay the Federal requirements. Facility owners or operators can be charged with felonies in federal courts, and their companies fined up to \$25,000 per violation per day, for failure to comply with applicable provisions of the Clean Air Act. Owners and operator are still subject to CAA requirements, compliance deadlines and penalties even if their state or local officials have provided incorrect guidance or are tardy in developing permitting or enforcement programs.

² A plant with potential emissions above the thresholds can escape major source designation and MACT requirements by securing a *federally enforceable state operating permit* that limits its operations so that its emissions are kept below the thresholds. Such sources are called *synthetic minor* or *synthetic area* sources.

F. MACT Requirements

In general, the NESHAP divides composites production operations into three groups: 1) those that must use add-on control to reduce HAP emissions by 95%, 2) those that are required to comply with certain work practice standards, and 3) those that must comply with certain emission limits by employing pollution prevention controls.

1. Sources are required to reduce HAP emissions by 95% for the following operations:

- Existing centrifugal casting and continuous lamination/casting operations with combined HAP emissions of 100 tpy or more. 40 CFR 63.5805(b).
- New open molding, centrifugal casting, continuous lamination/casting, pultrusion, SMC manufacturing (compounding), mixing, and BMC manufacturing (compounding) operations with combined emissions of 100 tpy or more. 40 CFR 63.5805(d). *Exception:* Operations at new sources making *large open molded parts* or *large pultruded parts*³ are instead required to comply with the emission limits shown in Table 3, and emissions from these operations are not counted toward the 100 tpy threshold for 95% control. 40 CFR 63.5805(d)(2) and 63.5799.

2. Sources are required to comply with the work practices standards shown in Table 4 to Subpart WWWW for the following operations:

- Closed molding operations using compression/injection molding
- Cleaning operations
- HAP-containing materials storage operations
- SMC manufacturing (compounding) operations
- Mixing operations
- BMC manufacturing (compounding) operations
- Pultrusion operations manufacturing parts with 1,000 or more reinforcements or the glass equivalent to 1,000 ends of 113 yield roving or more, and a cross section area of 60 square inches or more, *except* if subject to the 95 percent organic HAP emission reduction requirement. See Footnote 6 to Table 3 and Section 9 of Table 4 to Subpart WWWW.

3. Sources are required to comply with the emission limits shown in Table 3 to Subpart WWWW for the following operations:

- Existing and new open molding, centrifugal casting, pultrusion and continuous lamination operations, *except* if subject to the 95% control requirement or to the work practice standards. 40 CFR 63.5805(a) and (b).

G. Compliance options for open molding and centrifugal casting

With the exception of operations subject to 95% control, open molding and centrifugal casting operations may comply by using one of the following options:

- Demonstrate that the actual *emission factor* for each resin and gel coat application type does not exceed the HAP *emission limit* shown in the third column of Table 3 to Subpart WWWW. 40 CFR 63.5810(a).⁴
- Demonstrate that the average actual emission factor for each combination of operation type and resin application method or gel coat type does not exceed the HAP emission limit shown in the third column of Table 3 to Subpart WWWW. 40 CFR 63.5810(b).

³ For the purpose of determining applicability of the 95% HAP emission reduction requirement, *large open molded parts* are those that, when the final finished part is enclosed in the smallest rectangular six-sided box into which the part can fit, the total interior volume of the box exceeds 250 cubic feet, or any interior side of the box exceeds 50 square feet; and *large pultruded parts* are those that exceed an outside perimeter of 24 inches or have more than 350 reinforcements. 40 CFR 63.5805(d)(2)(ii) and (iii).

⁴ The composites NESHAP uses the term *emission factor* to refer to an estimate of actual emissions calculated using the formulas in Table 1 of Subpart WWWW (or site specific emission factors provided that they are incorporated in a facility’s air permit and are based on actual facility emission test data). A source’s calculated emission factors are then compared to the applicable *emission limits* from Table 3 of Subpart WWWW to determine compliance.

- Demonstrate that the weighted average of the actual emission factors for all resin and gel coat application over a 12-month period does not exceed the weighted average of the HAP emission limits shown in the third column of Table 3 to Subpart WWWW. 40 CFR 63.5810(c).
- Meet the HAP emission limit shown in Table 7 to Subpart WWWW for one operation type, and use the same resin for all operations of that type. 40 CFR 63.5810(d). This provision will allow a source, for example, to apply a 46.2% HAP resin for corrosion resistant applications using a combination of mechanical non-atomized, filament, and manual application, even though Table 3 would limit the HAP content for filament and manual application to, respectively, 42% and 40%.

ACMA's MACT/UEF Calculator can be used by sources to plan production, develop MACT compliance strategies, and demonstrate MACT compliance for their open molding operations. The Calculator contains Excel spreadsheets for each of the four compliance options described above, and can be downloaded by ACMA members from www.acmanet.org/members/ga/mact.cfm.

H. Compliance options for pultrusion

With the exception of a) operations subject to 95% control and b) operations subject only to work practice controls as described in Footnote f to Table 3 to Subpart WWWW, pultrusion operations are required to reduce HAP emissions by at least 60%, and can do so by using one of the following options:

- Employ capture and control technology that achieves emission reductions of 60%. 40 CFR 63.5830(a).
- Employ wet area enclosures and resin drip collection systems meeting certain criteria. 40 CFR 63.5830(b).
- Employ direct die injection systems with resin drip collection systems that meet certain criteria. 40 CFR 63.5830(c).
- Employ preform injection systems meeting certain criteria. 40 CFR 63.5830(d).
- Use any combination of the above options, provided that either a) each pultrusion machine satisfies the 60% reduction requirement, or b) the weighted average emission reduction is at least 60%, when wet area enclosures are assumed to achieve a reduction of 60% and direct die and preform injection a reduction of 90%. 40 CFR 63.5830(e).

I. Compliance options for continuous lamination/casting

With the exception of operations subject to 95% control, continuous lamination and continuous casting operations can comply by using one of the following options:

- Employ controls to reduce HAP emissions by at least 58.5%.
- Employ controls to limit HAP emissions to no more than 15.7 pounds per ton of resin, gel coat, and any added HAP.

Detailed instructions for complying with the requirements for continuous lamination and continuous casting are provided in 40 CFR 63.5865 through 63.5890, and in Tables 10, 11 and 12 to Part 63 Subpart WWWW.

J. Enforcement

In most cases, states or local air pollution agencies will enforce the composites NESHAP. 40 CFR 63.5925. Sources will typically work with these agencies to modify their Title V permits to reflect the applicable provisions of the composites NESHAP.

For many sources, modifying their Title V permit to include MACT requirements will be the most challenging part of complying with the NESHAP. The NESHAP contains many complicated compliance options, and permits will need to be carefully crafted to preserve the maximum flexibility for sources.

K. Definitions

Sources and permitting agencies will need to use the official definitions provided in the NESHAP. See 40 CFR 63.5935. Many terms commonly used in the industry have precise meanings given to them in the rule, including *corrosion-resistant resin*, *non-atomized application*, *filament application*, and *filled resin*.