Dec. 1, 2008
American Composites Manufacturers Association
Industry feasibility concerns - Final Control Technique Guidelines (73 FR 58481; Oct. 7, 2008)
Submitted in preparation for a Dec. 11, 2008 meeting with EPA/OAQPS, Research Triangle Park NC

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1. Control Technique Guidelines for Fiberglass Boat Manufacturing Materials

1.1 Feasibility of VOC limits

The Oct. 7 CTG places limits on the VOC content of resin and gel coat. In practice, these limits are translated through the supply chain to requirements on resin and gel coat producers. From the perspective of these materials suppliers, the CTG is not feasible. They will not be able to provide resin and gel coat that will allow their boatbuilding customers to comply with the CTG.

1.1.1 Non-HAP monomer VOC

Some resins and gel coats will contain monomers (reactive components) that are not styrene or MMA, that is, not HAP. In some cases, boatbuilders may use co-monomer resin formulations that contain both HAP and non-HAP monomers. These non-HAP monomers are considerably more expensive than styrene, but are needed to allow low-HAP resin or gel coat to be successfully processed or meet unusually demanding performance specifications. These non-HAP monomers feature substantially lower vapor pressures than styrene and MMA. Though it is not technically feasible to broadly substitute these monomers for styrene and MMA, when such substitutions have occurred in open molding processes, the result is lowered VOC emissions. For instance, the ANSI-approved and EPA-accepted equation for emissions of the non-HAP monomer vinyl toluene (VT) is 55% of the associated styrene emission rate equation.[1]

The intent of the Subpart VVVV NESHAP on which the CTG is based is to encourage sources and material suppliers to reduce HAP emissions by switching where feasible to non-HAP materials. The result is a decrease in total VOC emissions as well, even after considering the impact of non-HAP monomer.

EPA asserts that RACT limits based on the CTG are expected to be feasible because the NESHAP on which the CTG is based is feasible. However, consider a resin applied using non-atomized equipment having a styrene content of 30% and vinyl toluene (VT) content of 8% by formulation. This scenario would be fully compliant with Subpart VVVV, yet it would not satisfy the requirements of a RACT limitation based on the Oct. 7 CTG.

ACMA offers two alternative approaches to this problem.

1.1.1.1 Subpart VVVV compliance approach

Since the feasibility of the CTG is premised on the acknowledged feasibility of the Subpart VVVV NESHAP, the CTG should allow the use of any resin and gel coat application scenario that is allowed under Subpart VVVV. For example, the non-atomized application of resin with 30% styrene and 8% VT would be allowed by the NESHAP and therefore would be allowed under the CTG. This approach acknowledges the fact that non-HAP monomer substitution (to the extent feasible in boatbuilding) has lowered VOC emissions.

If the CTG prohibits the use of application scenarios that would otherwise be permitted under the NESHAP (as shown in the example above), then EPA would have no basis for a claim that the CTG is feasible or that it represents the application of reasonable and available controls.

1.1.1.2 Total monomer VOC emissions approach

This approach would limit the total monomer-VOC emissions to that which would be effectively permitted under the Subpart VVVV NESHAP. The approach depends on two assumptions. The first is that methyl methacrylate (MMA) is emitted at the same rate as styrene, which is precisely the approach taken by EPA in Subpart VVVV. The second assumption is that resin suppliers or sources will gain EPA acceptance for emission factors for non-HAP monomers, as they have already done for VT or have other factual basis such as vapor pressure data for use in estimating the emissions of non-HAP monomers.

Under the Oct. 7 CTG, resin applied using non-atomized application may have styrene content of 35%. Using again our example in Sect. 1.1, if the resin contains only 30% styrene, then non-HAP monomers that emit at the same rate as 5% styrene would be permitted. Applying the VT-to-styrene emission ratio of 0.55 to 8% VT content equals 4.4% styrene VOC equivalents, and this scenario would therefore be permitted under the CTG.

1.1.2 Lack of test method for, and non-enforceability of, limits on non-monomer VOC

The Oct. 7 CTG limits non-monomer VOC content of resin and gel coat to 5%. Any non-monomer VOC above 5% must be counted against the limit on monomer VOC. While the 5% limit may itself be feasible for some (but as EPA notes in the Oct. 7 CTG, not all) of the systems, resin and gel coat suppliers have no way to demonstrate the VOC content of their materials. Unlike HAP, there is no "list of VOC" that can be referred to, and therefore suppliers cannot simply use formulation data to determine VOC content. There is also no accurate and accepted laboratory test to measure the true volatile content of resin and gel coat, i.e. the content that would be emitted on the shop floor. EPA's Method 24 does have an option for multicomponent coatings, but the results of this test have no relationship to VOC emissions from resin and gel coat application scenarios because the test ignores wide variation in application method, laminate thickness and other factors that significantly affect actual VOC emissions. Moreover, since it is not possible to partition any Method 24 test result into monomer and non-monomer components, this test cannot be used to quantify non-monomer emissions. It is possible to derive a measure of non-monomer

VOC content from a standard solids test, but as will be described below, this measure likewise has no bearing on actual emissions in the shop.

ACMA argued in its Sept. 3 comments on the proposed boatbuilding materials CTG that EPA has no basis for establishing non-monomer VOC content limits in the CTG. The lack of an accepted and appropriate test method means that neither supplier, nor sources, nor EPA has any data to support a determination of actual VOC content. Based on lack of a workable test method, and the inability to use formulation data to determine VOC content, sources would not be able to demonstrate compliance with VOC limits for resin and gel coat.

RACT determinations based on the CTG would not be enforceable, since the sources would not be able to provide a test or supplier data to show that the VOC content of their resin and gel coats meets the RACT limits. ACMA's recent experience with several EPA Regions in VOC-related enforcement actions leads us to believe that the Regions will in fact demand test or formulation data in support of RACT compliance demonstrations. RACT rules based on the Oct. 7 CTG would place sources and states in the position of accepting VOC limits that may result in enforcement action or denial of permits by EPA Regions.

ACMA believes that EPA is prohibited by agency policy, statute and court decisions from issuing rules or guidance that are not based on sound data, or that as a practical matter cannot be complied with by sources or enforced by state agencies. The Oct. 7 boatbuilding CTG limits on non-monomer VOC fail both these tests.

Recent testing conducted by ACMA examined the emissions of widely used resins. Included in that study were the high-quality marine DCPD and ortho resins used neat (unfilled) for boatbuilding.[2] The purpose of this study was to determine whether non-monomer VOC content affected the VOC emissions from resin application under shop floor conditions. To measure non-monomer VOC content, we used (100% - solids%) as a measure of total VOC, and subtracted monomer% confirmed from GC analysis. We then compared EPA Method 25A measurements of VOC emissions to Method 18 measurements of monomer (styrene) emissions. Results for boatbuilding resins (average of three runs each) are summarized below:

Resin	NMVOC %	Method 25A ppm	Method 18 ppm	(25A-18)/25A as %
DCPD Marine Neat	2.5%	9.00	9.27	-3.0%
Ortho Neat	1.2%	7.70	7.77	-1.0%

The last column represents the percent of total VOC attributable to non-monomer content. If non-monomer VOC were 100% emitted as supposed by USEPA, the values here would be high positive numbers, because monomer emissions are only a fraction of monomer content. The reported slightly

negative values are not significantly different than zero, given the inherent accuracy of the two test methods. One must conclude that VOC emissions in the field are entirely attributable to monomer content, which is the basis of the MACT equations. So even if it were possible to reliably measure non-monomer VOC content, there is no basis for adjusting the MACT equations to account for such content. We suggested in our Sept. 3 comments that EPA should rely on this result to determine that the non-monomer VOC emissions from resin and gel coat application are insignificant, and as such do not merit regulation under state RACT rules.

1.2 Emission factors for filled resin

The Oct. 7 CTG (p.31-32) provides a formula to estimate emissions from filled resin. This formula is unnecessary, misleading, and incorrect. The EPA-approved emission factor system for composites used in the Subpart VVVV NESHAP provides emission estimates for resin in terms of pounds HAP emitted per ton of unfilled resin processed. These factors are accurate for both filled and unfilled resins because the basis is the weight of liquid resin in the system. For example, applying 2,000 pounds of an unfilled resin may result in 85 pounds of emissions. If that same 2,000 pounds of resin is formulated with 2,000 pounds of filler the total mixture equals 4,000 pounds. However, the emissions are based on *resin weight only* (2,000 pounds), therefore the emissions are the same 85 pounds as the unfilled version.

The composites manufacturing NESHAP, Subpart WWWW, takes this approach and is applied to filled resin application. There is not a need or a technical requirement for a separate emissions estimate for filled resins.

2. Control Technique Guidelines for Miscellaneous Metal and Plastic Parts Coating

In our Sept. 3 comments, we argued that monthly cross-line averaging is necessary for feasible compliance by custom shops. We don't understand why EPA can't offer this option in the CTG. States can decline to allow this where necessary.

We also believe that the CTG suffers from a lack of definitions for key terms used to specify emission limits, which is likely to result in costly disagreements and misunderstanding between state agencies and sources. For our industry, we suggest that the CTG should include definitions for the following terms (listed alphabetically):

Basecoat
Electric-Dissipating Coating
Extreme Performance Coating
High-Bake Coating
Low-Bake (Air-Dried) Coating
Metallic Coating
Mold Seal Coating
One-Component Coating
Primer

Topcoat
Two-Component Coating
Vacuum-Metalizing / Physical Vapor Deposition (Process)

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[1]Steve Shedd of OAQPS participates in the ANSI panel responsible for the UEF open molding emission factors. The ANSI panel recently approved new factors for VT and other methyl styrene isomers, which are based on emission testing using EPA-approved methods and theoretical considerations. Using the new factors, methyl styrene isomer emissions are estimated by using the UEF to estimate the styrene emission rate in the given application scenario, and then multiplying the styrene emission rate by 0.55. See the revised UEF table at www.acmanet.org/ga/ansi.cfm.

[2]See the test report at www.acmanet.org/ga/Resin_Screening_Test_Report-Final.pdf.