

**Potential Approaches to New AIM Coatings Regulations in  
Texas**

**Project H-54**

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**PCA Services, Inc.**

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# Potential Approaches to New AIM Coatings Regulations in Texas

## Introduction

The United States Environmental Protection Agency (EPA) has recently designated a 9-county area in the Dallas-Fort Worth (DFW) region of Texas as a “Moderate” nonattainment area for the new 8-hour ozone standards. As a result, the Texas Commission on Environmental Quality (TCEQ) is required to develop a new State Implementation Plan (SIP) that includes a plan for a 15% reduction in emissions of Volatile Organic Compounds (VOC) in the next 6 years. One potential target for reductions is the area emissions from the solvent utilization categories, which fall generally under the 24\*\*\*\*\* Source Classification Codes (SCC). These SCC include Architectural Coatings, Industrial Maintenance Coatings, and Traffic Marking Coatings. Collectively, these categories are called “Architectural and Industrial Maintenance (AIM) Coatings” by the EPA.

PCA Services, Inc. was asked to identify potential regulatory approaches to reducing VOC emissions from these categories. This paper gives a brief summary of other relevant Federal and state regulatory activity for these categories, and develops regulatory options for TCEQ’s consideration, along with estimated VOC emissions reductions that would be expected from each option.

## Recent History of AIM Coatings Regulations in the United States

The history of AIM Coatings regulations dates back to the late 1970s, when some of the larger Air Quality Management Districts (AQMDs) in California began to adopt regulations limiting various specific VOCs in AIM Coatings products (<http://www.arb.ca.gov/coatings/arch/rules/ruleinfo.htm>). (The AQMDs, rather than the CARB, have jurisdiction over AIM Coatings in California.) Probably the best known of these was the South Coast AQMD’s Rule 1113 (<http://www.aqmd.gov/rules/reg/reg11/r1113.pdf>), which was first adopted in September of 1977 and has been amended numerous times since. A few other states, notably Arizona, New Jersey, New York, and Texas, adopted VOC limits for various AIM coatings subcategories in the late-80s and early 90s.

In September of 1998, the USEPA adopted the “*National Volatile Organic Compound Emission Standards for Architectural Coatings*”, 40 CFR Part 59, (<http://www.epa.gov/fedrgstr/EPA-AIR/1998/September/Day-11/a22659.htm>). While the title might suggest otherwise, this regulation includes VOC limits for Industrial Maintenance (IM) Coatings and Traffic Marking Coatings, as well as the usual Architectural Coatings subcategories. Commonly referred to as the National (or Federal) AIM Coatings Rule, this rule became effective nationwide in September of 1999, and is the basic regulation governing VOC emissions from coatings in Texas as well as most other states.

In June of 2000, the CARB adopted a Suggested Control Measure (SCM) (<http://www.arb.ca.gov/coatings/arch/2000scm.pdf>) for optional use by other AQMDs in California that don't want to develop their own regulations. The CARB SCM, which is generally more stringent than the National AIM Coatings Rule but less stringent than the SCAQMD Rule 1113, was quickly adopted by the majority of the California AQMDs.

Subsequently, the Ozone Transport Commission (OTC) adopted a "Model Rule", which is very similar to the CARB SCM for use by their 12 member states plus the District of Columbia (<http://www.otcair.org/interest.asp?Fview=stationary#>). (The OTC is a multi-state organization created under the Clean Air Act (CAA) that is responsible for advising EPA on transport issues and for developing and implementing regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions.) As of June 2005, Delaware, the District of Columbia, Maine, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, and Virginia had adopted versions of this model rule. Two other states, Rhode Island and Massachusetts, had declared their intention to do so, and the other two were "considering" the issue.

Table I (Federal and State Aim Coatings Limits) (*See Appendix*) summarizes the following AIM coatings rules:

- National AIM Coatings Rule
- CARB SCM (2003 version)
- OTC Model Rule
- New York State's Rule 205.3, a slightly amended version of the OTC model rule, adopted in 2005
- SCAQMD Rule 1113 (2004 version)

While there are some obvious differences in the listed subcategories, it can readily be seen that there is unanimous agreement on many of them. This is generally an indication that the VOC limit given in the National Rule is very close to the lowest achievable with current technologies, while maintaining reasonable product efficacy (quality and utility). Among the other subcategories, it is less clear what the limit of efficacy for each subcategory is, because the limits haven't been in place long enough to provide a good test, except perhaps in southern California. There, year-round warm temperatures and low relative humidity provide a less stringent environment for coatings, for which freeze/thaw (separation) resistance, Minimum Film Formation Temperature (MFFT – a measure of the lowest temperature at which the coating can be applied, which can limit the painting season in cooler climates) and rate of evaporation after application are critical properties. Because of this factor, the limits adopted by some of the OTC states are more likely to allow for adequate product efficacy in cooler and higher humidity climates. The New York rule is listed because they have a very active Department of Environmental Conservation, and because their rule is one of the most recently adopted.

### **Development of Options**

PCA Services, Inc., has developed four options for consideration by TCEQ that reduce the VOC emissions from AIM Coatings (including I/M Coatings and Traffic Coatings). As set forth in the Project Work Plan, our aim was to develop recommendations to TERC and TCEQ that provide the most effective and cost-efficient reductions. Desirable characteristics of the proposed regulations include:

- Maximal ozone reductions
- Maximal VOC reductions
- Low regulatory and enforcement costs
- Ready acceptance by EPA as part of the SIP
- Acceptance by the regulated community
- Minimal impact on commerce in the state
- Minimal impact on small businesses in the state

To avoid extensive negotiations with both EPA and the regulated community, as well as to minimize regulatory cost, it is suggested at this stage that any new regulations in Texas be very similar in form and substance to previously adopted state or Federal regulations. That leads us to the various California and OTC regulations listed in Table 1 that have been adopted over the past 5-6 years.

The most recent versions of the SCAQMD Rule 1113 have been eliminated for three primary reasons:

- The ozone nonattainment situation in southern California may demand more stringent regulations than are necessary or prudent in other parts of the country.
- The climate in southern California makes possible adoption of limits in some coatings categories that may not be optimal in colder, more humid climates.
- The regulated community has taken exception to some of the limits in the most recent versions of Rule 1113.

That leaves the various permutations of the CARB 2000 AIM Coatings SCM, which include the OTC Model Rule and subsequently adopted state regulations that are variants of the OTC Model Rule. The recently adopted (2005) New York State Rule 205.3 is utilized as representative of the most recent of these variants.

Table 2 (Comparison of AIM Coatings Limits Options) presents various options for achieving VOC reductions. Option 1 essentially accepts the limits given in New York Rule 205.3, with one exception. In subcategories where New York elected to accept the prevailing limits in the National AIM Coatings Rule, they duplicated those limits in their state rule. This duplication has been excluded from Option 1. If, for whatever reason, Texas would prefer to include the National limits in their rule, it will make no difference in the emissions reductions calculated.

## Description and Explanation of Table 2

Column A of the Table lists the various subcategories that are included in one or more of the principal AIM rules of interest (National Rule, CARB SCM, OTC Model Rule). There is some duplication based on differences in terminology and/or methods of classification of the subcategories among the various rules.

Column B gives the VOC limits (in gram VOC/liter coating) in the National AIM Coatings Rule (Effective Sept. 1999). These represent the prevailing VOC limits in Texas that were used to calculate the Emissions Inventory baseline against which subsequent emissions reductions will be measured.

Column C gives an estimate for each subcategory of the percent of the total Emissions for AIM coatings (including I/M and Traffic Marking). E.g. “Dry Fog” coatings are estimated to contribute 1.06% of the total emissions from AIM coatings, based on the National Rule limits given in Column B. These estimates were calculated from CARB’s 2001 AIM Coatings Survey, Table 5-1

(<http://www.arb.ca.gov/coatings/arch/survey/2001/2001finrpt.pdf>), by simply dividing the total emissions from each subcategory by the grand total emissions from all subcategories. E.g., for “Dry Fog” coatings, the total VOC emissions were determined by CARB to be 497.6 tons/yr, which is 1.06% of the total of all emissions (46,814.5 tons/yr). All estimates were rounded to the nearest 2 decimal points. Although we recognize that this survey doesn’t exactly represent the national emissions breakdown, we believe the estimates are the best available, and that any errors resulting from this methodology are comparable to those from commonly used assumptions, such as percent of products represented in the survey, for example. Note also that rounding to two decimals captures emissions totaling 99.96% of the total when all subcategories are included. It should also be noted that these emissions percentages include thinning and cleanup solvents, so no later adjustments are required for those.

Column D gives the limits contained in New York’s Rule 205.3, except that where New York’s Rule duplicates the National Rule, the words “Nat’l Rule” were inserted rather than the number. For one subcategory – “Specialty Primers, Sealers and Undercoaters” – the limit matches the National Rule limit, but it was included because it is needed to ensure differentiation from the category “Primers, Sealers and Undercoaters”. Another way to handle it would be to note in the “Definitions” section of the regulation that “Specialty Primers, Sealers and Undercoaters” are not subject to the lower limit of the broader category (200 g/l), but rather to the National Rule Limit of 350 g/l.

Column E shows a method of approximating the emissions reduction percentages for each subcategory. **This method is only an approximation** that may be useful internally in evaluating **the various** Options. **It is not accepted by the industry or EPA** for calculating overall emissions reductions, and it should not be assumed to be more accurate than the aggregate emissions estimate simply because it is more detailed. This is because the VOC content of coatings products is calculated on a “Less water and exempt solvents” basis, so comparisons of “before and after” scenarios are necessarily done on a

“constant solids” basis. Since any reformulation would also likely include a change in the water/exempts content (and thus the solids content), a given percentage in regulatory VOC content might not result in an equivalent change in total VOC used.

The calculation for Column E is as follows:

$$\frac{(\text{Current limit} - \text{option limit})}{\text{Current Limit}} \times \text{Percent of inventory} = \% \text{ Emissions Reduction}$$

Or: 
$$\frac{(B-D)}{B} \times C = \% \text{ Emissions Reduction}$$

For example, for the Bituminous Roof Coatings subcategory:

Referring to the “Bituminous Coal and Mastics” category (Row 13) for the National Rule VOC limit – 500 g/l. Then:

$$\frac{(500-300)}{500} \times 4.75\% = 1.9\% \text{ reduction in emissions from the baseline}$$

Summing the percent reductions, Option 1 should reduce the AIM VOC emissions by ABOUT 40.2% from the current baseline. Option 1 results can then be compared to the calculated approximate emissions reduction estimates for other Options in Columns H, N and Q. Note that the relevant baseline should include Architectural, IM and Traffic Marking emissions, since those are included in the CARB survey totals.

On balance, Option 1 meets all the criteria set forth in the Work Plan:

- Maximal ozone reductions
- Maximal VOC reductions
- Low regulatory and enforcement costs
- Ready acceptance by EPA as part of the SIP
- Acceptance by the regulated community
- Minimal impact on commerce in the state
- Minimal impact on small businesses in the state

However, under Option 1, of the 27 subcategories with proposed new limits, 14 represent less than 1% each of the total baseline emissions, and result in emissions reductions totaling less than **about** 1.5% of the total. That leads to Option 2, which eliminates these very small subcategories from changes.

Columns G and H represent Option 2, which is similar to Option 1, except it eliminates new VOC limits for the 14 subcategories that each contribute less than 1% to the total emissions. This reduces the number of regulated subcategories from 27 to 13, and only changes the amount of emissions reductions by about 1.3%.

Summing these percent reductions, Option 2 should reduce the AIM VOC emissions by 38.9% from the current baseline. This option, then, offers significant improvement in four of the selection criteria:

- Low regulatory and enforcement costs
- Acceptance by the regulated community
- Minimal impact on commerce in the state
- Minimal impact on small businesses in the state

While giving a small amount on two others:

- Maximal ozone reductions
- Maximal VOC reductions

It is suggested that EPA would readily accept either option, assuming the proposed plan meets the threshold 15% ROP criterion.

Note that the potential positive impact on small businesses in the state might be the most significant change, since the smaller subcategories tend to be the province of small niche producers.

Columns M and N represent an intermediate option (Option 3), in which only Subcategories contributing less than 0.5% of total emissions are excluded. This results in a rule with 16 new limits, and an overall VOC emissions reduction of about 39.9%.

Columns P and Q represent a slightly more minimalist option (Option 4), in which subcategories contributing less than 2% are excluded. This results in a rule with only 11 new limits, and an overall VOC emissions reduction of **about** 37.4%.

#### Actual Total Emissions Reductions Expected

There is no perfect way to calculate the change in emissions to be expected from a regulatory change in VOC limits. Because product efficacy issues are paramount, each reformulation of a product is unique and may change the solids content as well as the VOC content. In order to meet VOC limits for some subcategories, formulators may be forced to change resin systems, which may even include changing from a solvent-based system to a water-based system.

The OTC calculated (*Control Measure Development Support Analysis of Ozone Transport Commission Model Rules*, E.H. Pechan & Associates, Inc., March 31, 2001) that the OTC AIM Coatings Model Rule would reduce VOC emissions by 31% from the National AIM Coatings Rule baseline. This was calculated from data generated in a 1993 *Industry Insights* survey for the National Paint and Coatings Association, which are the same data used in the regulatory negotiation process for VOC emissions reductions from the National Rule. While these OTC Model Rule Emissions reductions were calculated by Pechan “on a constant solids basis”, and thus have the same uncertainties highlighted above, they have been accepted thus far by industry and the EPA in the various OTC state rules, and are the preferred data set until and unless there is a new survey. It therefore is suggested that Texas follow precedent and assume VOC emissions reductions

(from the 2002 baseline including Arch/I/M and Traffic, adjusted for population) as follows:

Option 1 (full OTC Model – 27 subcategories)	31%
Option 2 (13 categories)	30%
Option 3 (16 categories)	30.75%
Option 4 (11 categories)	28.9%

$$\text{Pre-rule EF} = \text{EF}_{\text{Arch}} + \text{EF}_{\text{I/M}} + \text{EF}_{\text{Traffic}} = 3.23 + 0.0067 + 0.14 = 3.38 \text{ lb/p/yr}$$

In the above equation, EF without a subscript represents the total emission factor, whereas subscripts refer to component emission factors.

It is our understanding that because the Control Efficiency (31% for Option 1) already accounts for the percentage of affected products, the Rule Penetration value can be assumed to be 100%; and because compliance is by way of product reformulation, the Rule Effectiveness can also be assumed to be 100%. Thus, for Option 1:

$$\text{Emissions reductions} = (\text{Pre-rule EF})(\text{CE} \cdot \text{RT} \cdot \text{RE}) = (3.38)(.31 \cdot 1 \cdot 1) = 1.048 \text{ lb/p/yr}$$

Because there are no changes to the I/M or Traffic Coatings subcategories, all the emissions reductions would be assigned to the Architectural Coatings SCC, therefore:

$$\begin{aligned} \text{Post-rule EF}_{\text{Arch}} &= \text{Pre-rule EF}_{\text{Arch}} - \text{Emissions reductions} = \\ &3.23 - 1.048 = 2.18 \text{ lb/p/yr} \end{aligned}$$

### **Estimated Cost of Options Presented for AIM Coatings Limits**

A cost of about \$6400/ton of VOC reduction was estimated by CARB for their SCM (*Staff Report for the Proposed Suggested Control Measure for Architectural Coatings*, ARB, 2000), and subsequently adopted also by the OTC (*Control Measure Development Support Analysis of Ozone Transport Commission Model Rules*, E.H. Pechan & Associates, Inc., March 31, 2001). This estimate appears reasonable for the regulatory options presented in this report.

### **Conclusion**

The Ozone Transport Commission (OTC) Model Rule should serve as a good template from which to develop a new AIM Coatings regulation for Texas. The various options presented in Table 2 provide a basis for TCEQ in its decision-making. It should be noted that small details matter when it comes to matching compliance with technical feasibility in formulating coatings. Therefore, what might seem like minor changes in limits or definitions can cause significant practical concern on the part of industry segments. For that reason, it is suggested that TCEQ consult the more recently adopted state rules, especially New York and Maine's rules for such details. Please see "Notes for Consideration" in the Appendix for examples of individual wording and text in some of these rules that can have impact on both VOC reductions and compliance.

# **APPENDIX**

**APPENDIX Table 1: Federal and State Aim Coatings Limits**

	Coating Category Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR176	State CARB SCM	State OTC Recommend ed	State New York 205.3 STDs	SCAQMD Rule 1113 (2004 version)
	Rule adopted	Sept 98	June77		July 05	Sept 77
	Rule Amended	Eff. 99	Jun-00			July 04
9	Antenna	530	530	530	530	
10	Antifouling	450	400	400	400	
11	Anti-graffiti (Industrial Maintenance)	600				
12	Bituminous Coal and Mastics	500				
13	Bituminous Roof Coatings		300	300	300	
14	Bituminous Roof Primers		350	350	350	350
15	Bond Breakers	600	350	350	350	350
16	Calcimine Recoaters	475			475	
17	Chalkboard Resurfacers	450				
18	Concrete Curing Compounds	350	350	350	350	350
19	Concrete Curing and Sealing Compounds	700				
20	Concrete Protective	400				
21	Concrete Surface Retarders	780			780	
22	Conversion Varnishes	725			725	
23	Dry Fog	400	400	400	400	400
24	Enamel Undercoaters					
25	Extreme High Durability	800				
26	Faux Finishing/Glazing (Japans)	700	350	350	350	350
27	Fire Proofing, Exterior					
28	Fire Resistive		350	350	350	350
29	Fire Retardant, Clear		650			650
30	Fire Retardant, Opaque (Pigmented)		350			350

**Table 1: Federal and State Aim Coatings Limits (contd.)**

	Coating Category Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR176	State CARB SCM	State OTC Recommended	State New York 205.3 STDs	SCAQMD Rule 1113 (2004 version)
	Rule adopted	Sept 98	June77		Jul05	Sept 77
	Rule Amended	Eff. 99	Jun-00			July 04
31	Fire Retardant/ Resistive, Clear	850		650	650	
32	Flat Retardant/Resistive, Opaque	450		350	350	
33	Flat		100	100	100	100(50 7/1/06)
34	Flats, Exterior	250				
35	Flats Interior	250				
36	Flats, Specialty					
37	Floor	400	250	250	250	100 (50 7/1/06)
38	Flow	650	420	420	420	
39	Form Release Compounds	450	250	250	250	
40	Graphic Arts (Sign Paints)	500	500	500	500	500
41	Heat Reactive	420				
42	High Temperature (Industrial Maintenance)	650				420
43	High Temperature		420	420	420	
44	Impacted Immersion	780		340	780	
45	Industrial Maintenance	450	250		340	250 (100 7/1/06)
46	Industrial Maintenance Primers and Topcoats					
47	Lacquers (Including Lacquer Sanding Sealers)		550	550	550	
48	Lacquers, Clear Brushing		680	680	680	680 (275 2/1/05)
49	Lacquers, Clear					550 (175 2/1/05)
50	Lacquers, Clear or Pigmented (Including Lacquer Sanding Sealers)	680				
51	Lacquers Pigmented					550 (275 2/1/05)
52	Low Solids Coatings**		120	120	120	120

**Table 1: Federal and State Aim Coatings Limits (contd.)**

	Coating Category Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR176	State CARB SCM	State OTC Recommended	State New York 205.3 STDs	SCAQMD Rule 1113 (2004 version)
	Rule adopted	Sept 98	June77		Jul 05	Sept 77
	Rule Amended	Eff. 99	Jun-00			July 04
53	Low Solids Stains**	120				
54	Low Solids Wood Preservatives**	120				
55	Magnesite Cement	600	450	450	450	450
56	Mastic Texture	300	300	300	300	300
57	Metallic Pigmented	500	500	500	500	500
58	Multi-Color	580	250	250	250	250
59	Nonferrous Ornamental Metal Lacquers and Surface Protectants	870				
60	Nonflat Coatings		150	150	150	150 (50 7/1/06)
61	Nonflat High Gloss Coatings		250	250	250	
62	Non Flats, Interior	380				
63	Non Flats, Exterior	380				
64	Nuclear (Industrial Maintenance)	450				
65	Pre-Treatment Wash Primers	780	420	420	420	420
66	Primers and Undercoaters	350				
67	Primers, Sealers and Undercoaters		200	200	200	200 (100 7/1/06)
68	Quick Dry Enamels	450	250	250	250	250 (50 7/1/05)
69	Quick Dry Primers and Sealers					
70	Quick Dry Primers, Sealers, and Undercoaters	450	200	200	200	200 (100 7/1/06)
71	Recycled Coatings		250	250	250	250

**Table 1: Federal and State Aim Coatings Limits (contd.)**

	Coating Category Values expressed in g VOC/liter (less water and exempt solvents)		State CARB SCM	State OTC Recommended	State New York 205.3	SCAQMD Rule 1113 (2004 version)
	Rule adopted	Sept 98	June77		July 05	Sept 77
	Rule Amended	Eff. 99	Jun-00			July 04
72	Repair and Maintenance Thermoplastic	650				
73	Roof	250	250	250	250	250 (50 1/1/05)
74	Roof, Aluminum					(100 7/1/05)
75	Rust Preventative	400	400	400	400	40 (100 7/1/06)
76	Sanding Sealers					350 (275 7/1/06)
77	Sanding Sealers (Non- Lacquer)	550	350	350	350	
78	Sealers (Including Clear Wood Sealers)	400				
79	Shellacs, Clear	730	730	730	730	730
80	Shellacs, Opaque	550	550	550	550	550
81	Shellacs, Pigmented					
82	Specialty Primers					350 (100 7/1/06)
83	Specialty Primers, Sealers, and Undercoaters		350			
84	Stains		250			250 (100 7/1/07)
85	Stains, Clear	550				
86	Stains, Interior					250
87	Stains, Semitransparent	550				
88	Stains, Opaque	350				
89	Stain Controllers	720				
90	Swimming Pool	600	340	340		340
91	Swimming Pool Repair and Maintenance		340	340	340	340
92	Temperature-Indicator Safety		550	550	550	
93	Thermoplastic Rubber and Mastics	550			550	

**Table 1: Federal and State Aim Coatings Limits (contd.)**

	Coating Category Values expressed in g VOC/liter (less water and exempt solvents)		State CARB SCM	State OTC Recommended	State New York 205.3 STDs	SCAQMD Rule 1113 (2004 version)
	Rule adopted	Sept 98	June77		July 05	Sept 77
	Rule Amended	Eff. 99	Jun-00			July 04
94	Traffic Marking	150	150	150	150	150
95	Traffic, Applied to Other Surfaces					
96	Traffic, Applied to Streets and Highways					
97	Traffic, Black Traffic Coatings					
98	Varnishes	450	350	350	350	350 (275 7/1/06)
99	Waterproof Mastics					
100	Waterproof Sealers		250	250	250	250 (100 7/1/06)
101	Waterproof Sealers, Concrete/Masonry		400	400	400	400 (100 7/1/06)
102	Waterproofing Sealers and Treatments, Clear	600				
103	Waterproofing Sealers and Treatments, Opaque	600				
104	Wood Preservatives		350	350	350	350
105	Wood Preservatives, Below Ground	550				350
105	Wood Preservatives, Clear and Semitransparent	550				
107	Wood Preservatives, Opaque	350				
108	Zinc Rich Industrial Maintenance Primers					
109	Zone Marking	450				340 (100 7/1/06)

**Table 2: Comparison of AIM Coatings Limits Options**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR176	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx. % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx. % Red. in Emissions
Antenna	530						530	530				
Antifouling	450						400	400				
Anti-graffiti (Industrial Maintenance)	600											
Bituminous Coal and Mastics	500											
Bituminous Roof Coatings	Note 1	4.75	300	1.9	300	1.9	300	300	300	1.9	300	1.9
Bituminous Roof Primers	Note 1	0.34	350	0.1	350*		350	350	350*	0.1	350*	
Bond Breakers	600	0.05	350	0.02			350	350				
Calcimine Recoaters	475							475				
Chalkboard Resurfacers	450											
Concrete Curing Compounds	350	0.32	Nat'l rule				350	350				
Concrete Curing and Sealing Compounds	700											
Concrete Protective	400											
Concrete Surface Retarders	780							780				

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR1 76	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx. % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx. % Red. in Emissions
Conversion Varnishes	725							725				
Dry Fog	400	1.06	Nat'l rule		Nat'l rule		400	400	Nat'l rule			
Extreme High Durability	800											
Faux Finishing/Glazing (Japans)	700	0.17	350	0.09			350	350				
Fire Resistive							350	350				
Fire Retardant, Clear												
Fire Retardant, Opaque (Pigmented)												
Fire Retardant/Resistive, Clear	850						650	650				
Fire Retardant/Resistive, Opaque	450						350	350				
Flat	Note 2	12.17	100	7.3	100	7.3	100	100	100	7.3	100	7.3
Flats, Exterior	250											

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR1 76	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx % Red. in Emissions
Flats, Interior	250											
Floor	400	0.81	250	0.3			250	250	250	0.3		
Flow	650						420	420				
Form Release Compounds	450	0.67	250	0.3			250	250	250	0.3		
Graphic Arts (Sign Paints)	500	0.07	Nat'l rule				500	500				
Heat Reactive	420											
High Temperature (Industrial Maintenance)	650											
High Temperature	Note 3	0.08	420	0.03			420	420				
Impacted Immersion	780						340	780				
Industrial Maintenance	450	15.57	340	3.81	340	3.81		340	340	3.81	340	3.81
Lacquers (Including Lacquer Sanding Sealers)	680	2.27	550	0.43	550	0.43	550	550	550	0.43	550	0.43
Lacquers, Clear Brushing	Note 4	0.47	680	0	680		680	680	680*		680*	
Lacquers, Clear												

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR1 76	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx. % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx. % Red. in Emissions
Lacquers Pigmented												
Low Solids Coatings**	Note 5	0.01	Nat'l rule		Nat'l rule		120	120				
Low Solids Stains**	120											
Low Solids Wood Preservatives**	120											
Magnesite Cement	600	0.12	450	0.03			450	450				
Mastic Texture	300	0.71	Nat'l rule				300	300	Nat'l rule			
Metallic Pigmented	500	2.63	Nat'l rule				500	500	Nat'l rule		Nat'l rule	
Multi-Color	580	0.01	250	0.01			250	250				
Nonferrous Ornamental Metal Lacquers and Surface Protectants	870											
Nonflat Coatings	Note 6	15.81	150	9.57	150	9.57	150	150	150	9.57	150	9.57
Nonflat High Gloss Coatings	Note 6	3.36	250	1.15	250	1.15	250	250	250	1.15	250	1.15
Non Flats, Interior	380											

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR176	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC)	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx % Red. in Emissions
Non Flats, Exterior	380											
Nuclear (Industrial Maintenance)	450							450				
Pre-Treatment Wash Primers	780	0.08	420	0.04			420	420				
Primers and Undercoaters	350											
Primers, Sealers and Undercoaters	Note 7	7.84	200	3.36	200	3.36	200	200	200	3.36	200	3.36
Quick Dry Enamels	450	2.46	250	1.09	250	1.09	250	250	250	1.09	250	1.09
Quick Dry Primers, Sealers, and Undercoaters	450	6.13	200	3.41	200	3.41	200	200	200	3.41	200	3.41
Recycled Coatings							250	250				
Repair and Maintenance Thermoplastic	650											
Roof	250	0.52	Nat'l Rule				250	250	Nat'l rule			
Roof, Aluminum												
Rust Preventative	400	0.73	Nat'l rule				400	400	Nat'l rule			

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR176	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx % Red. in Emissions
Sanding Sealers												
Sanding Sealers (Non-Lacquer)	550	0.12	350	0.04			350	350				
Sealers (Including Clear Wood Sealers)	400											
Shellacs, Clear	730	0.1	Nat'l rule				730	730				
Shellacs, Opaque	550	0.47	Nat'l rule				550	550				
Specialty Primers												
Specialty Primers, Sealers, and Undercoaters	Note 7	0.26	350*				350	350				
Stains (combine next two categories)	Note 8		250	4.49	250	4.49	250	250	250	4.49	250	4.49
Stains, Semitransparent	550	7.58										
Stains, Opaque	350	1.25										
Stain Controllers	720											

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category	Federal U. S. EPA 63FR1 76	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx. % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx. % Red. in Emissions
Swimming Pool	600	0.05	340	0.02			340					
Swimming Pool Repair & Maintenance	Note 9	0.09	340	0.04			340	340				
Temperature-Indicator Safety							550	550				
Thermoplastic Rubber and Mastics	550							550				
Traffic Marking	150	3.05	Nat'l rule		Nat'l rule		150	150	Nat'l rule		Nat'l rule	
Varnishes	450	4.03	350	0.9	350	0.9	350	350	350	0.9	350	0.9
Waterproof Sealers	600	1.87	250	1.09	250	1.09	250	250	250	1.09		
Waterproof Sealers, Concrete/Masonry	Note 10	1.2	400	0.4	400	0.4	400	400	400	0.4		
Wood Preservatives	Note 10	0.68	350	0.25			350	350	350	0.25		
WoodPreservatives Below Ground	550											

**Table 2: Comparison of AIM Coatings Limits Options (Contd.)**

A	B	C	D	E	G	H	J	K	M	N	P	Q
Coating Category  Values expressed in g VOC/liter (less water and exempt solvents)	Federal U. S. EPA 63FR1 76	Approx. % of Inventory CARB'01 Survey (Inc. thinners & Cleanup VOC	Option 1 "OTC-Like" (NY State)	Option 1 Approx. % Red. in Emissions	Option 2 "OTC-Like" with >1% of total emissions	Option 2 Approx. % Red. in Emissions	State OTC Recommendations	State New York 205.3 Stds	Option 3 "OTC-Like" with >.5% of total emissions	Option 3 Approx % Red. in Emissions	Option 4 "OTC-Like" with >2% of total emissions	Option 4 Approx % Red. in Emissions
Wood Preservatives, Clear and Semitransparent	550											
Wood Preservatives, Opaque	350											
Zinc Rich Industrial Maintenance Primers												
Zone Marking	450											
Percent of Total Emissions in CARB Survey		99.96 %										
Total of all over 1% (n=18)		98.3%										
Total of all over 2% (n=14)		92.8%										
Approx. % Emissions reductions	<b>Do not or cite. Internal</b>	<b>quote For use only.</b>	(27 Subcategories lowered)	40.2		(13 Subcategories lowered)	38.9		(16 Subcategories lowered)	39.9	(11 Subcategories lowered)	37.4
(From baseline inc. I/M and Traffic Coatings)												

## **NOTES TO TABLE 2**

\*Needed to differentiate special category to be covered under Definitions in Rule, but not counted as a separate category.

\*\*Industrial maintenance goes in separate SCC Code (2582) in Emissions Inventory.

\*\*\*Traffic marking goes in separate SCC Code (2242) in Emissions Inventory.

NOTE: The words, "Nat'l Rule" were inserted where the value in the box is covered under the national AIM Coatings Rule.

NOTE: Special safety items (Rows 30, 31, and 84) were very small, and were omitted from limits for safety reasons.

Note 1: Federal rule (EPA) is covered under "Bituminous Coal and Mastics" row.

Note 2: Federal rule (EPA) is covered under "Flats, Exterior" and "Flats, Interior" rows.

Note 3: Federal rule (EPA) is covered under "High Temperature (Industrial Maintenance)" row.

Note 4: Federal rule (EPA) is covered under "Lacquers (Including Lacquer Sanding Sealers)" row.

Note 5: Federal rule (EPA) is covered under "Low Solids Stains and Low solids Wood Preservatives" rows.

Note 6: Federal rule (EPA) is covered under "Non flats, Exterior and Non Flats, Interior" rows.

Note 7: Federal rule (EPA) is covered under "Primers and Undercoaters" row.

Note 8: Federal rule (EPA) is covered under "Stains, Semitransparent and Stains, Opaque" rows.

Note 9: Federal rule (EPA) is covered under "Swimming Pool" row.

Note10: Federal rule (EPA) is covered under "Waterproof Sealers" row.

## APPENDIX (Contd.)

### Notes For Consideration – Review of Other State and Regional Rules

1. In the OTC Model Rule, “Varnish” is defined as follows: *“2.59 Varnish: A clear or semi-transparent wood coating, excluding lacquers and shellacs, formulated to dry by chemical reaction. Varnishes may contain small amounts of pigment to color a surface, or to control the fetal sheen or gloss of the finish.”*

Besides the obvious changing of the typo “fetal” to “final”, Maine’s rule drops the words *“on exposure to air”*; a small change, to be sure, but a potentially important distinction, since varnishes harden by chemical reaction, not air drying.

2. The Maine Rule contains a provision, Section 3H, that appeared in the OTC rule, but was not found in the New York Rule, and which could be important to painters on a high humidity day: *“3H. Lacquers. Notwithstanding the provisions of section 3(A), a person or facility may add up to 10% by volume of VOC to a lacquer to avoid blushing of the finish **during days with relative humidity greater than 70% and temperature below 65<sup>0</sup>F, at the time of application, provided that the coating contains acetone and no more than 550 grams of VOC per liter of coating, less water and exempt compounds, prior to the addition of VOC.**”*
3. The New York rule contains the following Exemption for Small Businesses. No similar exemption was found in the OTC or Maine rules.

#### **205.7 Limited exemption for small AIM coatings manufacturers.**

(a) Small AIM coatings manufacturers may request for an exemption to the VOC content limits in section 205.3(a) of this Part. This request shall include a demonstration acceptable to the director, Division of Air Resources, Department of Environmental Conservation on the small manufacturers' inability to produce coatings that meet the VOC content limits based on economic and/or technical feasibility.

(b) The request shall at a minimum include the following small AIM coatings manufacturers' production and product information:

- (1) The total quantity (gallons) and the VOC content of each and all of the coatings listed in section 205.3(a) of this Part manufactured by the company for each of the three previous years.
- (2) Documentation and analysis supporting the economic or technical infeasibility of meeting the VOC content limits for

each coating listed in section 205.3(a) of this Part requesting an exemption.

(3) A statement from a responsible official in the company certifying the accuracy and completeness of the information provided in the request.

(c) The request shall be made at least one year prior to the compliance date of January 1, 2005 and be made to the director, Division of Air Resources, Department of Environmental Conservation. The department reserves the right to request additional information from the responsible official.

(d) The director, Division of Air Resources, Department of Environmental Conservation shall grant or deny the limited exemption in its discretion based on the information supplied pursuant to subdivision (b) of this section at least six months prior to the compliance date of January 1, 2005.

(e) Small AIM coatings manufacturers that have been granted a limited exemption under subdivision (d) of this section shall submit, by April 1st of each year the exemption remains in effect, a report to the director, Division of Air Resources, Department of Environmental Conservation that includes the following manufacturing information from the previous calendar year:

(1) The quantity of the individual coatings listed under section 205.3(a) of this Part produced by the company and the VOC content of the coatings which have been granted an exemption from the VOC content limits in section 205.3(a) of this Part under this section;

(2) The quantity of coatings manufactured for each of the product names of the coatings which have been granted an exemption from the VOC content limits in section 205.3(a) of this Part under this section were marketed under; and

(3) A statement from a responsible official certifying the accuracy and completeness of the information provided in the report.

(f) Any exemption granted under subdivision (d) of this section may remain in effect no later than December 31, 2007.

(g) Small AIM coatings manufacturers may request a three-year extension to the exemption granted under subdivision (d) of this section at least six months prior to its expiration. This request shall be made to the director, Division of Air Resources, Department of Environmental Conservation. In applying for this extension, small AIM coatings manufacturers must document the efforts made to reduce the VOC content of the coatings exempted from the VOC content limits. The reporting requirements in subdivision (e) of this section remain in effect for small AIM coatings manufacturers granted an extension to the exemption.

(h) Limited exemptions for small AIM coatings manufacturers as approved by the director, Division of Air Resources, Department of Environmental Conservation under this Part, will be submitted to the EPA as State Implementation Plan revisions for approval.