Original: 2238
cc: Commissioners
Harbison/not Clark

SHERWIN WILLIAMS

WOOD CARE GROUP

RECEIVED
2003 SEP -8 PM 12:00
INDEPENDENT REGULATORY
REVIEW COMMISSION

September 5, 2003

Commissioner John R. McGinley, Jr.
Independent Regulatory Review Commission
333 Market Street, 14th Floor
Harrisburg, PA 17101

Re: Environmental Quality Board Regulation No. 7-371, Architectural and Industrial Maintenance (AIM) Coatings Rule

Dear Commissioner McGinley:

On behalf of Sherwin-Williams and our over 1,000 employees residing in Pennsylvania, we want to thank the Independent Regulatory Review Commission for its comments on the proposed AIM Rule submitted to the Department of Environmental Protection on March 25, 2002. Unfortunately, the Department has taken a position firmly opposed to any changes in VOC limits for any of the coating categories of concern to Sherwin-Williams and has given scant consideration to the requests made by IRRC during the rulemaking process. We thus come before IRRC again to express our serious concerns with the final rulemaking package which was approved by the EQB on July 15, 2003, and is now before the Commission for final approval.

Sherwin-Williams has been an active participant throughout the rulemaking process, having filed comments with the EQB in response to the proposed rule, as well as having filed comments with IRRC in response to the proposed rule. Sherwin-Williams' representatives subsequently met with various officials in the Pennsylvania Department of Environmental Protection, including Secretary McGinty, to again reiterate our concerns with this rulemaking package. In forwarding to the EQB the final rule and its Comment and Response Document, the Department refused to consider or address the overwhelming scientific evidence that waterborne coatings are simply not available for certain applications involving interior wiping stains and interior clear and semi-transparent wood coatings. We write to you, therefore, to urge that you disapprove the final rule for the reasons set forth herein.

IRRC Comment – How will these potential alterations impact the quality of the products?

DEP made no independent assessment of the coatings technologies. When asked to adopt some modest amendments to the rule to recognize the substantial amount of information demonstrating that the state of coatings research and development efforts had failed to produce a water-based stain which prevented lapping, or a water-based, bare-wood, clear coating which would prevent paneling, DEP staff simply indicated that it did not want to "break ranks" with other states that are considering similar standards. DEP staff has not conducted independent assessment of these rules. Its reliance on studies performed by others, without recognition of the significant inapplicability of those studies to the specific problems with the AIM rules is evident in the cursory responses made by DEP in the Comment and Response Document. One example of this lack of technical expertise at DEP is the response to Comment 10, wherein DEP suggests that light sanding can resolve grain raising caused by waterborne stains. This explanation fails to recognize that such sanding removes the stain in an inconsistent manner causing a speckling of the finish. DEP is simply not capable of understanding the technical aspects of coatings manufacture and application and is unable to respond to or refute our technical concerns.

Another example of DEP lack of technical expertise in coatings technology is their failure to appreciate that the only way to avoid potential panelization with the coatings the AIM rule mandates is to apply water-based coatings under controlled low humidity conditions; something that is impossible to control in new construction where finishes are applied prior to installation and operation of HVAC systems. DEP has pointed out that water-based coatings have been applied successfully at the Bryce Jordan Center at Penn State and at some suburban Philadelphia high schools, but most schools in Pennsylvania do not have air-conditioned gyms; thus, summer control of humidity during refinishing operations is impossible. The AIM rule will thus consign gym floor refinishing in schools without sophisticated HVAC systems to dry, winter months - the height of the basketball season. The Department has used the shibboleth of "consistency" with the OTC rule to avoid properly addressing the real issues which industry has presented.

DEP has also relied, to the detriment of all Pennsylvanians, on flawed understanding of rulemakings in the State of California. Many local jurisdictions in the State of California have adopted much more stringent standards but, as demonstrated, compliant coatings for certain categories will not meet performance requirements as will coatings that meet the National Rule. DEP has relied almost exclusively on the California rules and a report written by staff members of a California advisory body in support of the current AIM rulemaking package.

IRRC Comment – [The Department] estimates the cost of implementing this regulation will be $65 million per year. This estimate is based on [a California staff report] ... How are the figures developed for California applicable to the Commonwealth?

The cost estimates adopted by DEP for the current AIM rule are based on the *incremental* costs of California local jurisdictions' adopting more stringent standards for only eleven coating categories (rather than the 48 categories in the Pennsylvania proposed AIM rule), and thus the costs to Pennsylvania consumers are significantly misrepresented by the Department. Under the rule, Pennsylvania consumers would see significant changes in the coatings they apply; changes which are not considered for many of the categories in the California calculations. Additionally, due to the wide variability in cost per ton of VOC reduction calculated for the 11 categories evaluated in California (from no cost increase to more than $15,000 per ton) the cost estimate for the Pennsylvania rule, which merely assumes that the average cost for the 11 categories studied for the California rule ($6400 per ton) would apply to the cost of compliance with the 48 categories regulated under the Pennsylvania rule, is arbitrary and capricious. The Department has simply ignored this material point.

It should also be noted that the Department's estimate of the total tons of VOC reduction is not supported by reliable data. Sherwin-Williams requested additional background data from DEP shortly after the May EQB meeting at which the AIM rulemaking was tabled. The Department refused to provide the data which supports its conclusions with respect to a 31% overall reduction in VOC emissions from rule implementation, instead referring Sherwin-Williams to industry sources which do not explain how DEP's consultant arrived at its emissions reductions calculations. The Department cannot explain or justify the 31% figure. This data is important because we believe that an AIM rule can be developed which achieves more emission reductions while providing the flexibility for certain coatings categories for which there is no reasonable alternative to the limits imposed by the National Rule promulgated by EPA.

The fact that the Department cannot explain how it derived its emissions reduction estimate, a fundamental requirement of the rulemaking, is disturbing as well as arbitrary. Because of the apparent flaws in the database used to calculate emissions reduction achievable from the rule, not surprisingly, the Department in the final rule preamble thus deleted reference to overall cost (originally estimated at $65 million) and references only the incremental cost of $6,400 per ton. No independent, reliable estimate of the cost of the Pennsylvania rule was performed by the Department.

IRRC Comment – [C]ommentators have requested the following adjustments or additions be made to Table 1: ... 2) the standards for sanding sealers, varnishes and clear and semi-transparent stains should be raised to 550, 450, and 550, respectively, the standard should be 350 for exterior wood primers, sealers and undercoaters, the standard for floor paints should be changed to 280-400 ... The Board should provide the rationale for these standards, as well as the inclusion or omission of products in Table 1.

In order for certain products to comply with the standards in Table 1, they have to be reformulated from an oil base to a water base. One such line of products is Sherwin-Williams fine line of Minwax products for interior wood finishing. As explained above, water based wiping stains can cause lapping and grain-raising problems and water based finishes can cause panelization problems. The limits requested by Sherwin-Williams for these products are those mandated by the federal rule, which was promulgated by EPA in 1998.

DEP is ill equipped to promulgate regulations establishing chemical composition of consumer products. It does not possess the technical expertise of the federal government in this area. The U.S. EPA studied the architectural coatings industry extensively before promulgating the federal regulations referenced in the Pennsylvania statutory provision quoted above. On September 11, 1998, EPA promulgated the National Volatile Organic Compound Emission Standards for Architectural Coatings (40 CFR 59.400 et seq.) ("National Rule"). Those standards are resulting in significant reductions in VOC emissions in the Commonwealth and across the nation. Those are the only standards that the Pennsylvania General Assembly has authorized DEP to enforce.

The numerical limits which the Department proposed for the interior wood categories were developed in California and adopted there by some, but not all, of the air districts which enact rules of local applicability. Sherwin-Williams has provided technical evidence that climatic variation between California and Pennsylvania makes certain coating limits unworkable under our northeastern climate. The Department's response was to produce a chart showing relative humidity comparisons between California and Pennsylvania. Not surprisingly, that graph showed little variation in relative humidity. Relative humidity, however, is a poor basis for making climatic comparisons without simultaneously comparing temperature. This is due to the fact that warmer air holds more moisture, and thus has a higher moisture content at equal relative humidity than colder air. As a result, there is much less atmospheric moisture in Pennsylvania in January than there is in California, because the average temperature in winter is more than 40 degrees colder in Pennsylvania. When the dry winter air in the East is warmed by indoor-heating systems, the indoor relative humidity plummets, causing wood to dry out. It is the swelling and drying effect on indoor wood surfaces caused by winter heating and summer humidity which causes the effect referred to as panelization, in which wood, treated with waterborne coatings during periods of high humidity, cracks, causing expensive damage to wood floors when the floors dry out in the winter heating season.

The Department has conducted no research on the technical feasibility of water based coatings for interior wood use, but has instead relied on general statements made by various manufacturers regarding the suitability of their coatings for certain applications. The Department actually provided copies of such product claims as proof that compliant coatings exist. Reliance on such claims is misplaced and misleading. The attached memorandum discusses some of these products and their respective claims.

IRRC Comment – How will the restrictions of these products affect businesses that utilize these materials?

One way that use may vary is that gym floors may need to be recoated during the winter (when school is in session) rather than during the summer. As explained above, water based floor finishes applied when the wood is swelled by humidity can cause the individual boards to be effectively glued together. When the wood

dries out during the winter heating season, the glued seams do not separate, causing the wood to split in a phenomenon called panelization. While some colleges and more affluent school districts may have climate-controlled gymnasiums that control moisture content through humidification in the winter and air conditioning in the summer, many gymnasiums do not have such sophisticated HVAC systems. Also, some gymnasiums may have removable flooring that does not generally exhibit panelization due to the small sections being separable. Waterborne coatings applied to dry wood or in situations in which the wood does not dry out after coating are not as likely to cause panelization. For these reasons, the fact that some schools have been able to successfully use waterborne coatings without damage is of little comfort to smaller school districts which cannot afford to install winter humidification systems or summer air conditioning systems in their gymnasiums to prevent the wood floors from swelling and drying in response to indoor humidity levels. Those districts will be forced to apply waterborne coatings in the winter or risk permanent damage to their floors. The cost to consumers and flooring contractors to repair this damage has not been taken into consideration by the Department.

Fundamental Legality Issue.

While Sherwin-Williams and other industry members have tried to work with DEP in developing a rule which would allow the Commonwealth to "take credit" with the EPA for additional, achievable reductions in VOC emissions which the research and development efforts of coatings manufacturers like Sherwin-Williams have made possible, the Department has blindly proposed a "model" rule without addressing substantial technological concerns about certain coating categories and without any independent assessment of whether the limits it seeks to impose are, in fact, achievable in practice. Now we are forced to confront the fundamental truth that the AIM rule exceeds EQB's delegated rulemaking authority and is thus contrary to Pennsylvania law.

To the extent that Pennsylvania is given any authority to regulate consumer products pursuant to the Commerce Clause, that regulation must be through specific act of the General Assembly; and no specific or implied authority can be found in the Air Pollution Control Act delegating such authority to DEP or the EQB. The Pennsylvania General Assembly, when it amended the Pennsylvania Air Pollution Control Act in 1992 in response to the Congressional amendments to the federal Clean Air Act that were promulgated in 1990, addressed the issue of consumer product regulation, not by delegating rulemaking authority to the EQB, but by conferring limited enforcement authority upon DEP. While Congress explicitly authorized the U.S. Environmental Protection Agency to regulate the VOC content of consumer products, such as architectural coatings, the Pennsylvania General Assembly vested no such rulemaking authority in the Pennsylvania DEP, nor in the EQB. Instead, the Legislature authorized DEP to enforce the federal standards, not promulgate its own more stringent standards. The specific provision of the Pennsylvania Air Pollution Control Act reads:

"The Department shall have the power and its duty shall be to—
***
(26) Develop and submit to the Environmental Protection Agency a procedure to implement and enforce the regulations which the Environmental Protection Agency adopts under section 183(e) of the Clean Air Act to reduce emissions from consumer and commercial products, provided the department will receive credits for the reductions attributed to the Federal consumer and commercial products regulations under section 182 of the Clean Air Act regulations, and the department has the resources to implement and enforce the program." 35 P.S. 4004.

The Air Pollution Control Act delegates certain rulemaking authority to the EQB, but those powers are specifically enumerated in thirteen explicit subsections to 35 P.S. 4005, only one of which mentions regulation of consumer products. That provision, section 4005(a)(13), merely authorizes the EQB to promulgate a rule for aerospace coatings and does not grant any general authority to regulate architectural coatings or any other broad

source of coatings. It is an axiomatic principle of statutory construction that the particular controls the general. 1 Pa.C.S. 1933. Additionally, since violation of any rule or regulation enacted pursuant to the Air Pollution Control Act is punishable as a crime pursuant to 35 P.S. 4009, the statute granting the authority to define a criminal act through regulation must be strictly construed. 1 Pa.C.S. 1928(b). Thus, the current AIM Rulemaking is not authorized by law.

It is also important to note the expressed intent of the legislature that the delegated rulemaking authority is not to be broadly construed, but is specifically limited by a requirement that any rule be no more stringent than a specific federal rule. 35 P.S. 4004.2. If Pennsylvania chooses to regulate architectural coatings beyond the levels set by EPA, that choice must be made by the Pennsylvania General Assembly in the form of a specific statute or by delegating additional specific rulemaking authority to the EQB. Absent such action, the current AIM rule is *ultra vires;* and we urge the IRRC to disapprove the regulation pursuant to its statutory authority as the gatekeeper for agency actions that exceed statutory authority.

In short, the AIM regulation is not authorized by law and thus is not in the public interest as defined in Section 5.2(a) of the Regulatory Review Act. This issue is fundamental to the Commission's function and can be raised by the Commission at any time in order to avoid an ultra vires action by the Commonwealth. Additionally, even if the legislature were to amend the Air Pollution Control Act to authorize the EQB to enact some form of AIM rule, the current rule is not in the public interest under the criteria of Section 5.2(b) of the Regulatory Review Act because the Department has inadequately considered the economic burden on manufacturers, flooring contractors and consumers and has failed to consider whether less burdensome alternatives for certain coatings categories should be implemented. All of the latter issues were raised in the Commission's comments on the proposed rule as set forth in its March 25, 2002 Comments.

We respectfully request that the Commission disapprove the final AIM rule for the foregoing reasons.

Sincerely,

Harvey P. Sass
President & General Manager
Sherwin Williams Wood Care Group

HS:cr
Attachment

Interior Clear and Semi-Transparent Stains.

The problems caused by waterborne stains are grain raising and lapping. Grain raising is the unavoidable swelling and standing up of short broken fibers of wood caused by absorbed water. This results in an uneven surface, which cannot be sanded smooth without removing stain from the swelled grain, causing a speckled finish. Lapping is caused by the fact that waterborne stains dry more quickly than oil stains, causing more stain to be deposited where stain is applied along the edge of a previously stained section, causing a dark streak where the stains overlap.

The following products were identified by the Department of Environmental Protection as meeting the proposed AIM coating limits and as being suitable for interior wood floor staining and finishing. The comments following each product name indicate the manufacturer's limitations or other pertinent information about the product's limitations.

Safecoat Durastain. The manufacturer's fact sheet recommends staining only a 2' x 3' section at time and keeping a wet edge to prevent lapping. This application method is impractical and not recommended for large floors.

VanAqua-220 Water-Based Stain. The manufacturer's fact sheet recommends coating large surfaces with a wet layer prior to wiping to avoid lap marking. This application is impractical and not recommended for large floors due to the fact that the product dries "remarkably fast – usually within 15 minutes."

Clear Wood Interior Varnishes.

Waterborne varnishes can cause panelization or splitting of wood surfaces when applied during high humidity due to the gluing effect of the varnish, which causes adjacent boards to bond, and splitting as the wood substrate dries during periods of lower indoor humidity.

Behr Clear Satin. This 350 g/L solvent-borne varnish is similar to products offered for sale by Sherwin-Williams in California. Such products have been poorly received by consumers and completely rejected by flooring professionals due to inferior application and handling characteristics (viscosity-related) versus 450 g/L varnishes.

Cloverdale Acrylic Urethane Varnish. The manufacturer's fact sheet does not recommend this product for wood floors. Cabinets and doors are constructed differently than floors and do not exhibit the panelization problems which floors experience.

Columbia Acrylic Urethane. This product also is not recommended for interior floors, only for "cabinets, paneling, molding, furniture and other similar items." The fact sheet does suggest that wood floors could be coated if a cross-linker is added to the coating. Crosslinking makes the dry film stronger to help it resist scuffing and marring. Unfortunately, this greater strength also increases the likelihood of panelization.

Fuhr Waterborne Acrylic Varnish and Water-Clear Acrylic Varnish. These products are not recommended for floors. Designed for kitchen cabinets these products are claimed to be suitable for "furniture, molding, passage doors, millwork and wine racks."

HallmanLindsay Acrylic Urethane. This product is not recommended for floors. The manufacturer's fact sheet claims this product is suitable for "cabinets, doors, trim, table tops and furniture."

PPG Acrylic Polyurethane. While this product is claimed to be suitable for floors, the Limitations of Use in the manufacturer's fact sheet states: "Do not use on high traffic or commercial floors," thus, making it unsuitable for gymnasium applications.

Sherwin-Williams Waterborne Polyurethane Varnish. The Department apparently felt that the fact that Sherwin-Williams manufactured a "compliant" coating "impeached our credibility." In fact, this product, which is useful in many interior applications, is not intended for use on commercial floors.

Compliant Gym Floor Sealers.

Although not regulated as a separate category in the rulemaking, DEP, in an apparent attempt to explain away the panelization problems reported by Sherwin-Williams, supplied information on products claimed to be compliant gym floor sealers.

Basic Hydroline Wood Floor Sealer. This product actually comes with a manufacturer' s guarantee against sidebonding (the cause of panelization as discussed above). The Department provided a copy of this guarantee to the legislative staff, but failed to provide the fact sheet for the Installation Treatment, which has to be applied before the Hydroline Sealer. That fact sheet states that the Treatment must be applied when the cracks in the wood are at their widest. This occurs in dry winter months in Pennsylvania. That fact sheet also states that the Treatment is effective because the Hydroline Sealer will not adhere to the Treatment. Since the sealer will not adhere, such performance will inevitably lead to peeling of the Sealer.

Bona Sport Super Sport Seal. This manufacturer claims its product minimizes sidebonding but states in bold print: "USE ONLY IN STRUCTURES WITH HUMIDITY AND TEMPERATURE CONTROLS." See our discussion above on how such controls can minimize panelization.

As you can see, the Department went to great lengths to "disprove" Sherwin-Williams' allegations concerning the availability of suitable compliant coatings for certain interior uses. However, a closer and technically accurate examination of their evidence shows that there are no suitable alternatives.

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Attachment B

COMMENTS BEFORE THE PENNSYLVANIA INDEPENDENT REGULATORY REVIEW COMMISSION IN SUPPORT OF THE PENNSYLVANIA AIM RULE

Gene M. Pettingill (9/12/03)

GOOD MORNING. MY NAME IS GENE PETTINGILL. I'M AN ENVIRONMENTAL ENGINEER WITH THE STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL AND I DEVELOPED THE ARCHITECTURAL AND INDUSTRIAL MAINTENANCE COATINGS RULE - THE AIM RULE – FOR DELAWARE. I'M HERE TODAY TO ADD OUR SUPPORT TO THE AIM RULE PENNSYLVANIA IS NOW CONSIDERING.

MY CREDENTIALS INCLUDE 3 YEARS WITH DNREC AND 37 YEARS WITH DUPONT IN VARIOUS POSITIONS INCLUDING MANAGER OF MANUFACTURING WITH RESPONSIBILITY FOR EIGHT PLANTS IN EIGHT COUNTRIES, PLANT MANAGER, AND CONSTRUCTION MANAGER. MY LAST FIVE YEARS AT DUPONT, BEFORE RETIRING, WERE HEAVILY INVOLVED WITH ENVIRONMENTAL COMPLIANCE. I AM A CHEMICAL ENGINEERING GRADUATE OF THE UNIVERSITY OF COLORADO.

STARTING IN THE FALL OF 2000, ALONG WITH PEERS FROM OTHER STATES IN THE NORTHEAST, INCLUDING PENNSYLVANIA, I WAS A MEMBER OF THE OZONE TRANSPORT COMMISSION (OTC) WORKGROUP THAT DEVELOPED THE AIM MODEL RULE. ALONG WITH THE WORKGROUP, I REVIEWED THE EXTENSIVE WORK DONE BY CALIFORNIA IN SUPPORT OF THEIR AIM RULE AND BY THE EPA FOR THE FEDERAL RULE. THE CALIFORNIA AIR RESOURCES BOARD AND SOME OF THEIR AIR DISTRICTS HAVE BEEN WORKING ON AND IMPROVING AIM RULES SINCE THE 1970'S AND HAVE DEVELOPED A WEALTH OF PERTINENT SCIENTIFIC DATA. THEY HAVE INCLUDED COATINGS MANUFACTURERS AND OTHER STAKEHOLDERS IN ALL ASPECTS OF RULE DEVELOPMENT AND, IN THE CASE OF THE SOUTH COAST AIR DISTRICT, HAVE SUCCESSFULLY REDUCED VOC CONTENT LIMITS LOWER THAN WE OR PENNSYLVANIA PROPOSE. THE OTC WORKGROUP ALSO DISCUSSED THE MERITS OF PROPOSALS TO REDUCE VOC LEVELS BELOW THE FEDERAL RULE TO MORE NEARLY MIRROR CALIFORNIA LIMITS IN THE VARIOUS COATING CATEGORIES WITH REPRESENTATIVES OF THE NPCA, SHERWIN-WILLIAMS, VALSPAR, BENJAMIN MOORE AND OTHER

COATING MANUFACTURERS. FROM THIS EFFORT CAME THE OTC MODEL RULE, A FRAMEWORK FOR ALL MEMBER STATES TO USE IN SECURING EPA REQUIRED REDUCTIONS IN GROUND-LEVEL OZONE CONCENTRATIONS THROUGH REDUCTIONS IN VOC EMISSIONS. WE SHARED THE NEED TO MAKE THESE VOC REDUCTIONS TO INSURE BEING IN ATTAINMENT OF THE GROUND-LEVEL OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS. WE ARE NOT NOW IN ATTAINMENT.

DELAWARE, AS WITH PENNSYLVANIA, DID NOT ACCEPT THE MODEL RULE EXACTLY AS WRITTEN AND MADE CERTAIN CHANGES WE BELIEVED WERE APPROPRIATE. FOR EXAMPLE, AT STAKEHOLDERS REQUEST, WE ELIMINATED WHAT THEY BELIEVED WERE ONOROUS REPORTING REQUIREMENTS AND ADDED SOME SPECIFIC COATING CATEGORIES.

IN DEVELOPING THE DELAWARE RULE, WE INVESTED SIGNIFICANT EFFORT IN DETERMINING WHAT COATINGS WERE CURRENTLY OFFERED BY MANUFACTURERS THAT MET ALL REQUIREMENTS OF THE DELAWARE RULE. THIS WAS IN ADDITION TO THE FINE WORK

DONE BY CALIFORNIA. IN A SURVEY OF TECHNICAL LITERATURE FROM OVER 100 NATIONAL AND REGIONAL MANUFACTURERS, WE FOUND, WITHOUT DIFFICULTY, SOME 2400 EXAMPLES OF AVAILABLE QUALITY COATINGS THAT MET OR WERE WELL BELOW OUR RULE VOC CONTENT LIMITS, WHICH ARE THE SAME AS THE VOC CONTENT LIMITS OF THE PENNSYLVANIA RULE. THIS CONFIRMED FOR US THAT OUR INTERPRETATION OF THE CALIFORNIA DATA WAS INDEED CORRECT AND THAT THE RULE WAS NOT TECHNOLOGY FORCING.

DELAWARE'S WAS THE FIRST AIM RULE TO BE ENACTED IN THE OTC REGION, WHICH COMPRISES 12 NORTHEAST STATES AND THE DISTRICT OF COLUMBIA. THE RULE WAS CHALLENGED BY COATINGS MANUFACTURERS, INCLUDING SHERWIN-WILLIAMS AND THE NPCA, BEFORE THE DELAWARE ENVIRONMENTAL APPEALS BOARD AND WAS UPHELD BY A UNANIMOUS DECISION. THIS 5 MEMBER BOARD IS APPOINTED BY THE GOVERNOR AND INCLUDES A PHD CHEMIST AND A LAWYER WITH CONGRESSIONAL CLEAN AIR ACT EXPERIENCE. THE BOARD'S DECISION IS CURRENTLY UNDER APPEAL IN SUPERIOR COURT.

DELAWARE HAS RESEARCHED THE BASES OF THE AIM RULE THROUGHLY AND IS CONVINCED THE PREMISE IS SOUND AND THAT THE COATING MANUFACTURERS , AT LEAST THOSE THAT WISH TO, CAN EASILY MEET RULE REQUIREMENTS WITHOUT UNDUE EFFORT. THE TECHNOLOGY TO PRODUCE COMPLIANT FORMULATIONS OF HIGH QUALITY THAT MEET ALL MANUFACTURERS STORAGE, TRANSPORTATION, APPLICATION AND PERFORMANCE REQUIREMENTS CLEARLY EXISTS. SUCH FORMULATIONS, MADE BY NATIONALLY KNOWN MANUFACTURERS, CAN BE PURCHASED TODAY.

DELAWARE UNEQUIVOCABLY SUPPORTS PENNSYLVANIA'S AIM RULE AS A NECESSARY STEP IN INSURING CLEAN AIR FOR ALL OF US.

Presented by

Gene M. Pettingill
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IRRC

From: Carroll, John [CARROLLJ@pepperlaw.com]
Sent: Monday, September 08, 2003 4:28 PM
To: IRRC
Cc: 'allen.j.danzig@sherwin.com'; 'mkharding@sherwin.com'; 'dan.m.forestiere@sherwin.com'
Subject: Comments on AIM Rulemaking.

#77626 v1 - revsed irrc letter...

Message for Mary Lou Harris and Chris Markham:

In response to several questions posed by Chris on Friday, I am enclosing a letter which explains some of the problems with the underlying emissions data calculations. These issues have a direct bearing on estimated cost of compliance as well. Please call me if you have any further questions or concerns. Thank you for your consideration of our concerns.

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Original: 2238

September 5, 2003

Mary Lou Harris
Independent Regulatory Review Commission
333 Market Street, 14th Floor
Harrisburg, PA 17101

Re: AIM Rule Objections

Dear Mary Lou:

I want to thank you and the other IRRC staff members for meeting with The Sherwin-Williams Company representatives to discuss the AIM rulemaking adopted by the Pennsylvania Environmental Quality Board. We appreciated the open and frank discussion of the issues and the consideration by the staff of Sherwin-Williams concerns.

As we explained at our meeting, the AIM rulemaking is flawed for numerous reasons, many of which demonstrate that the Rule is arbitrary, capricious and based upon studies and data that are unreliable and unsupported by recognized statistical and scientific methodology. While Sherwin-Williams will separately provide the Commissioners with written information directed at the factors raised in IRRC's earlier comments on the proposed rule, I am sending this letter to clarify subsequent discussions with Chris Markham during which we discussed some of the data flaws in the Department's estimates of emission reductions and the net effect of the flexibility in certain subcategories requested by Sherwin-Williams during the rulemaking proceedings.

In this letter we wish to provide IRRC with information and analysis that specifically demonstrates that there are significantly more tons of VOCs that will be reduced by the adoption of the AIM rulemaking than the 31% estimated by Pechan in its report of March 31, 2001 upon which the Department has blindly relied. As a result, for example, the stringent limitations on five subcategories of important wood coatings products that would otherwise have to be substantially eliminated from the market in Pennsylvania, will not be necessary.

By requiring the specific reduction of VOC in five subcategories of wood coating products, the Commonwealth will essentially be banning those products from use for many important applications, since the products will no longer meet performance requirements with the reduced VOCs. Sherwin-Williams has been diligently researching and attempting to develop water borne substitutes with performance equivalent to the solvent borne coatings for over a decade for such applications, but so far has been unsuccessful. We are unaware of any other company that has been successful, either.

The 5 subcategories include:

1. Interior wood stains – clear and semi-transparent
2. Interior wood varnishes
3. Interior wood sanding sealers
4. Exterior wood primers
5. Porch, floor and deck coatings (opaque)

These products have not been studied or analyzed by Pennsylvania or any other OTC state to determine under the AIM rulemaking (1) their performance, (2) availability of adequate substitutes, (3) cost of reformulation, or (4) impact on air quality. The OTC has arbitrarily relied on other extraneous data and studies that are not applicable to Pennsylvania. As a result, the actual results from the adoption of the AIM rulemaking will be far different from the expectations, all to the detriment of the citizens of Pennsylvania.

Greater Savings Than Predicted Are Realized From AIM rulemaking

For some arbitrary reason, the Department (and its consultant, Pechan) did not utilize a reliable database to reach the conclusions upon which it based its new regulatory standards in the AIM rulemaking. It used data summaries that resulted in erroneous conclusions. Use of more reliable data and transparent and reproducible calculations shows that there will be far greater savings than estimated by Pechan if the AIM rulemaking is adopted. If Pennsylvania takes it upon itself to adopt rules based upon these erroneous conclusions, especially without analyzing the situation as it relates to the facts in the Commonwealth, the Rule should and will be struck down.

The problems with the OTC/Pechan/Department analysis are many. Some of them include:

1. The Pechan analysis was based upon a survey reduced to a spreadsheet (the "database") that was ***voluntary***. Not all companies responded since they were not required to respond. While the larger manufacturers did respond, they are the producers of lower VOC products, thus perhaps biasing the results to show lower VOCs emitted from existing products than actually occurs in the real world. Flaws in use of the data inherently will result in fewer emission reductions estimated by Pechan at any given VOC limit enacted than will actually occur.

2. The survey on which Pechan's data was based was far less comprehensive than the California surveys. The California surveys are mandatory, include all sales of all products, and have been conducted repeatedly (4 times) over the last 20 years. They are also quality controlled. The AIM rulemaking is almost identical to the California Air Resources Board

("CARB") Suggested Control Measures ("SCM"). Since the AIM rulemaking essentially adopts the California SCM limits for most categories of coatings, it would be prudent to base the analysis of emission reductions on the same survey data and make any adjustment necessary to the data. To not do so and use less reliable ***voluntary*** survey data is arbitrary and will not meet the scientific statistical standards necessary to sustain a finding that the AIM rulemaking is not arbitrary.

3. The voluntary survey on which the data Pechan used was incomplete. The shortcoming is obvious since the database that Pechan is using shows total VOC emissions of 758,338,092 pounds nationally from all source categories. The U.S. census shows a 1990 population of 248,709,873. The database thus results in a per capita emission factor of only 3.05 pounds per person per year. However, EPA provides a baseline emission factor of 6.7 pounds per person per year, which was determined independently from the survey database that Pechan uses to determine emission reductions. This discrepancy reveals a significant under-reporting of VOC emissions in the database and cannot be rationalized to the 6.7 emission factor used by Pechan to estimate pre-rule emissions. The database is obviously incomplete.

4. There is an inherent problem with the methodology used by Pechan to determine the emission reductions, since for some VOC limits, the database would produce a negative emission reduction. The database highlighting these discrepancies was provided to IRRC staff during our recent meeting. Since the calculation only determines the VOC emissions saved when a higher VOC product is reduced to the limit, it should not be possible to obtain an increase in VOC emissions when the VOC limit for a given product is reduced. This inherent flaw in shows again that there is a problem with the database. *See* anomalies in the spreadsheet (database) used by Pechan in Column "H" for lines 397, 433, 467, 468, 547 and 623 provided to you at our earlier meeting.

5. After the National Rule came into effect, since much of California already had more restrictive limits, the VOC emission per capita for California was determined to be between 2.5 and 3.0 pounds/person/year. After the AIM rulemaking, we estimate, using the California data, that VOC emissions will be reduced to 2.05 pounds/person/year in Pennsylvania. Pechan predicts that after adoption of the AIM rulemaking, the per capita emissions will be 3.7 pounds/person/year. That is a nonsequitor. It is not possible that after application of the AIM rulemaking the per capita emissions of VOCs (3.7 pounds) could be greater than before the limits contained in the current AIM rulemaking was adopted in California (2.5 to 3.0 pounds). The per capita results of the adoption of the AIM rulemaking in California and Pennsylvania should be very close to each other. Pechan's report, relied upon by the Department, cannot reconcile this obvious error.

After performing numerous calculations, we feel reasonably comfortable that Pechan made its conclusions from the information in the voluntary survey that there would be a 31%

reduction in VOC emissions if the OTC states adopted the AIM rulemaking. ***The actual reductions in VOC emissions from the adoption of the AIM rulemaking will be closer to 60%.*** Pennsylvania and the other states will have much more flexibility with reductions of this magnitude to adjust limits for specific coatings categories such as those requested by Sherwin-Williams while still significantly reducing VOC emissions. The 60% reduction is calculated using the more statistically reliable California survey data. We know of no valid objection to this data's use to predict emission reductions.

It has been statistically predicted by California that adopting the CARB SCM for architectural coatings will result in a 20% reduction in VOC emissions for the State compared with current emissions. The current VOC emissions from AIM coatings in California are significantly less than the emissions in Pennsylvania since California has had severe VOC restrictions for architectural coatings for some time. Since the Pennsylvania AIM rulemaking is the California SCM, it is reasonable to assume that the results of both rules should be comparable and that the per capita emissions after the rules are in effect should be comparable.

The table at Tab 1 is the Calculation of Expected Emission Reductions using the California survey results with the appropriate adjustments. The California survey shows sales of architectural coatings having emissions of 43,300 tons of VOCs per year. The total population of California is a little under 34,000,000 people. California expects a 20% reduction from the implementation of the Rule. If one takes the total emissions reported in the California survey and reduces it by 20%, the result is an expected emission, after the Rule, of 34,640 tons per year. Dividing 34,640 by the population of a little less than 34,000,000 results in a per capita emission of 2.05 pounds per person per year.

Pechan's report estimates for Pennsylvania a post-National Rule emission factor of 5.36 pounds per person per year. Pennsylvania's population in the year 2000 was reported as 12,281,054. If we apply that 5.36 pounds per person to the Pennsylvania population, the result is an expected current total emission of 32,913 tons of VOCs per year, with the National Rule in effect, before the new proposed AIM rulemaking. Pechan then estimates that the post-AIM rulemaking emissions will be 3.7 pounds per capita, or 22,720 tons per year based on the population of Pennsylvania. Based on California's 2.05 pounds per capita estimate of post-AIM rulemaking emissions, however, Pennsylvania should expected total emissions, after the Rule, of only 12,588 tons per year, or more than 10,000 additional tons of emission reductions than estimated by Pechan.

Sherwin-Williams has requested that emissions limits for certain subcategories of coatings be retained at the current limits in the National Rule and not be reduced to the unattainable limits mandated by the AIM rulemaking. While such adjustments would result in fewer emission reductions on an overall basis, the amount of emission reductions gained by using current market data as discussed above will result in 20 times more emission reductions for

Pennsylvania than the "lost" reductions for the categories of concern to Sherwin-Williams. Thus, the emissions predicted for Pennsylvania, after consideration of the Sherwin-Williams issues is equivalent to a 58% overall VOC emission reduction and a final emission rate of 2.24 pounds per capita.

The subcategories and requested limits upon which the 58% emission reduction is based are:

	OTC	National Rule Requested
Interior wood clear and semitransparent stains	250	550
Interior wood varnishes	350	450
Interior wood sanding sealers	350	550
Exterior wood primers	200	350
Porch, floor and deck coatings (opaque)	250	380

These requested modest increases in the limits, if adopted, would allow these popular products to continue to be used in Pennsylvania until a suitable substitute can be developed.

Sincerely,

John W. Carroll

Original: 2238

Testimony of the
National Paint and Coatings Association
Before
Pennsylvania Environmental Quality Board
on
January 18, 2002
Concerning the Proposed Rulemaking on
[25PA.CODE CH. 130]
Architectural and Industrial Maintenance Coatings
[31 Pa.B 6807]

Good Afternoon. I am Robert Nelson, Senior Director, Environmental Affairs for the National Paint and Coatings Association. I am please to provide the views of the National Paint and Coatings Association concerning the proposal to establish Chapter 130, Subchapter C relating to the regulation of architectural and industrial maintenance coatings.

The National Paint and Coatings Association is a voluntary, nonprofit trade association representing some 400 manufacturers of paints, coatings, adhesives, sealants, and caulks, raw materials used in their manufacture. As the preeminent organization representing the coatings industry in the United States, NPCA's primary role is to serve as ally and advocate on legislative, regulatory and judicial issues at the federal, state, and local levels. Over the past two decades, the NPCA has been extensively involved in the development of clean air regulations at all levels of government, including extensive involvement and participation in California air pollution control district rulemaking activities as well as the activities of the OTC Architectural Coatings Work Group and the activities of the Pennsylvania Department of Environmental Protection on the development of this rule. While we strongly believe in and support initiatives to improve the quality of our air, we also believe Pennsylvania has a responsibility to weigh the environmental benefits gained with the economic impacts.

As you are aware, the proposed rule is based on the model rule that has been recommended by the Northeast Ozone Transport Commission (OTC) for adoption by all of the states within the Northeast Ozone Transport Region. We have submitted a copy of the extensive comments that NPCA filed in response to Delaware's proposed adoption of the same model rule.[1]

The dominant theme of our comments is that: we do not believe that many of the VOC content limits listed in the rule are technologically feasible for all of the wide-ranging substrates, application environments and conditions for which a particular category of coatings will be used.

[1] Please note that Attachment A provides concise summary the NPCA Alternative Proposal for Revision of OTC Model Rule.

While compliant coatings may be suitable for many substrates and application environments, they may not be for others. .

It is not simply a question of more cost and less efficiency. It's a question of clean air as well. If coatings are less effective and require more applications, or more frequent recoating, any benefits from the reductions in VOC emissions in the coating may be reduced or eliminated by the need to use more material and thus release more VOCs. The new lower VOC limits (100 g/l) for flat coatings will eliminate currently available low VOC waterborne exterior flat coatings (less than 150 g/l) that can be applied in cooler months when ozone is not a problem. This will force additional coating usage during the hotter summer ozone formation months and clean air objectives will be undermined, not furthered.

You will note in our comments to Delaware that weather conditions have a major impact on the efficacy of coatings. These conditions are even more important for Pennsylvania with its more severe climatic conditions and wider state regional climatic/environmental differences (Allegheny mountains to the Delaware River shore).

The limits are based on ones established in California which are currently under litigation brought by the NPCA. Among the concerns of the NPCA are that the solvent restrictions for many of the coatings involved will result in poorer performing and less durable coatings. In some cases the limits are so low as to compromise effective lower solvent waterborne coatings which have been developed to replace higher solvent coatings.

This is not simply an aesthetic issue. It affects the primary purpose of a coating – protection. It is not a minor issue.

As a compromise and to show our commitment to reducing ozone, we respectfully request that Pennsylvania adopt the attached alternative Table of Standards and rule provisions which have been submitted by the NPCA for consideration by Delaware.

The NPCA compromise will achieve approximately 70% of the VOC emission reductions that are hoped for under the OTC Model AIM Rule being considered by New Jersey and other OTC states. More importantly, because the NPCA limits and provisions represent realistic expectations of technologically feasible coatings chemistries and do not sacrifice crucial application and performance characteristics, we believe that the NPCA approach could well reduce VOC emissions by a greater amount than the OTC Model Rule -- they will not have the paint failures, reduced durability, etc., we believe will be associated with the technologically infeasible limits of the OTC Model Rule.

Further, the NPCA provisions would place the AIM coatings rule on a more equal footing with the Consumer Products Rule by including (1) variance, (2) innovative technology, and (3) averaging provisions. Equity and basic fairness do not permit certain products to be singled out and discriminated against by denying them provisions which are granted to other products to ease regulatory burdens. Also, these provisions actually enhance the efficiency of compliance by allowing flexibility and innovation. It would be arbitrary to provide this for one set of products and deny it to another. It is extremely important to

note that all of these provisions are "VOC neutral" in the sense that they will not result in the net increase of VOC emissions.

This is most clearly seen in the case of averaging. Here, before a manufacturer would increase VOC content of a product above the authorized limit, it would have to ensure the availability of a sufficient amount of below compliance VOC product such that there would be no net increase in VOC emissions from his products as a whole. Under the averaging program of the South Coast Air Quality Management District, significant penalties attach for failures to "keep the ledgers straight" in this regard.

Averaging will permit manufacturers to meet important niche market protective needs, for example, in the broad industrial maintenance coatings category where protection needs and application and exposure environments can often present unique requirements, necessitating a higher VOC product for optimum performance and durability. It will also give them more flexibility in balancing performance requirements across product lines, including in the areas of freeze/thaw stability and the capability to apply more coatings in cooler weather (early spring/late fall – non-ozone formation periods). And again it must be emphasized that averaging does not increase VOC emissions – it merely allocates them to their most required/efficient application as determined by the marketplace and consumer needs. This provision also is seen as absolutely essential for the industry to continue to provide an adequate range of colors. While this an aesthetic and not a protective issue, it nonetheless is an extremely important one. For most people, a residence is not simply their largest capital asset – it's their home.

Adoption of the proposed (California based) limits would eliminate cost effective, readily applied, durable coatings for Pennsylvania's homes, churches, schools, hospitals, prisons, commercial, industrial and public structures and will have the following consequences:

- Many coatings will have to be applied more often, in some cases requiring several coats when before one would have been sufficient, increasing the very clean air problem the regulation seeks to cure;

- Many waterborne coatings will have to be stored and transported in heated environments to prevent the freezing and destruction of the paint;

- Virtually all exterior painting and unheated interior painting will be confined to the warmer months only, drastically reducing the livelihoods of contractors and forcing a large number of coatings to be applied when the smog is at it worst instead of cooler periods when there is no smog;

- Many coatings will take longer to dry and cure especially in humid/colder weather leaving the coating more vulnerable to dirt pick up and even complete failure;

- Many coatings will be far more difficult to apply because of their dry times, composition, and increased vulnerability to slight changes in the temperature and humidity;

- Elimination of cost effective durable and scrub resistance interior and exterior wall and trim coatings used for high traffic/usage/impact or extreme exposure environments like exterior wooden windows and door, interior trim and book shelves, kitchen/bathroom walls, children rooms;

- Elimination of cost effective high-traffic floor and porch coatings, and garage floor coatings;

- Elimination of small volume specialty coatings that are designed to cost effectively meet special needs – such as anti-graffiti coatings that are within the budgets of inner city business establishments;

- Reduction in the availability of colors for interior and exterior coatings, and gloss levels; and

- Elimination of effective interior and exterior penetrating stains for wood including interior decorative woods and exterior siding and decks

The limits and approaches that we have proposed at Attachment A of the comments will secure clean air improvements in a cost effective, efficient way. As stated in Attachment B, our approach will secure an additional 21% reduction in VOC emissions beyond the current national AIM coatings rule. Your office is tasked with determining the efficacy of proposed rules and we ask that you review the proposal and our comments thoroughly, in applying this criterion.

One important area where the proposal has gone astray in this connection is the decision to not recognize many of the national rule specialty coatings categories and their unique VOC content limits. While three of these categories have been added by the OTC AIM Work group since the OTC model rule was initial developed, (and we compliment the PA DEP staff for their involvement in these efforts) the OTC AIM Work Group has not acted on our request to recognize additional ones.

A good example is the anti-graffiti coatings category and its national rule limit. As was pointed out in the letter from one of our member companies to the OTC, these coatings are very low volume, niche market coatings that serve an extremely important social purpose. In light of their unique performance characteristics they will never be used as a general purpose coating. Notwithstanding this the OTC group has declined to recognize the coating, stating that effective technology at the general industrial maintenance VOC limit was currently available.

Over the last six months, this company has attempted to formulate a new lower VOC coating or resin system that would be effective against the new growing graffiti instrument of choice – indelible ink pens. The lower VOC materials mandated by the rule only work in 50% of the cases for indelible inks and cost around 50% percent more per gallon. The higher VOC coatings rejected for inclusion in the model rule work in all cases and cost 50% less per gallon, a price differential that is especially important to local governments and businesses battling graffiti. This example illustrates but does not exhaust our many concerns about the cost effectiveness of the proposed rule.

Thank you for the opportunity to present these comments. If you have any questions, I would be pleased to try and address them. The NPCA will be submitting additional written comments before the close of the comment period on February 22, 2002.

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January 18, 2002 Attachment A

Summary of Industry Alterative Proposal For Revision of
[25 PA.CODE CH. 130]
For
Architectural and Industrial Maintenance Coatings

The NPCA has developed an Alternative Proposal for the revision of the Pennsylvania Department of Environmental Protection proposed rule [25 PA.CODE CH. 130] for Architectural and Industrial Maintenance Coatings. This proposal consists of two types of recommended changes to the Pennsylvania/OTC Model AIM rule: changes that will have no effect (neutral impact) on the VOC reduction credit; and changes that are being recommended due to product performance needs and requirements. The latter revisions to the draft will no doubt have some effect on the amount of VOC reduction credits that the OTC states are will be able to get from the implementation of such a revised AIM rule.

We believe that due to technology changes and customer preference, the actual VOC reductions garnered from the implementation of this revised rule will be very close to those original projected by the OTC. To this end, the NPCA AIM Work Group would like to work with the OTC AIM Work Group on developing and conducting a VOC Content Survey of the AIM Products sold in the OTC region. This survey would provide assurance to the OTC states that VOC reductions are being made.

The proposed PA DEP rule should be revised to include the following provisions:

1. Averaging (Modeled after Rule 1113 and administered on a regional basis.

2. An AIM Specific Variance provision.

3. A scheduled Technology Assessment on the appropriateness of maintaining future VOC limits to be administered by the OTC.

The proposed PA DEP rule should be revised to eliminate:

1. Unnecessary and burdensome reporting and requirements found in Sec.130.305.

If Pennsylvania and the other OTC states find that these extensive and costly reporting requirements are key to implementation and compliance of their AIM rules, these requirements could be undertaken on a regional basis similar to our recommendation that the "averaging provision " be administrated on a regional basis.

II. Revised VOC Limits based on Product Performance Needs and Requirements

These recommended changes to the VOC Content limits in Proposed (and the modifications category definitions) are based on product performance needs and requirements.

The following changes to the Table 1- VOC Content Limits for Architectural Coatings should be made to the Proposed PA DEP rule:

Coating category	Effective January 1, 2005 Grams VOC per liter (g/l)	Current PA Position
Flat Coatings		
Exterior coatings	150	100
Interior coatings	100	100
Non-flat coatings:	200	150
Non-Flat -- High Gloss	380	250
Floor coatings	250(b)	250
Lacquers (including lacquer sanding sealers)	680	550
Specialty primers sealers and undercoaters **(Modified definition)**	350	350
Quick-dry coatings:		
Enamels.	380	250
Primers, sealers, and undercoaters	350	200
Sanding sealers (other than lacquer sanding sealers)	550	350
Stains:		
Clear and semitransparent	550	250

b (Alternate recommendation is a 250 g/l limit for waterborne and 380 g/l limit for solvent borne.)

Opaque	350	250
Varnishes	450	350

Recommended Changes to the proposed Definitions

In order to implement the revision to the TOS, the following definitions need to be modified in Section (b) Definitions of the draft/Model rule

Nonflat – High gloss coating means a non-flat coating that registers a gloss of 70 or above on a 60 –degree meter according to ASTM Designation D523-89(1999).

Specialty primer means a coating formulated and recommended for application to a substrate to block stains, **odors or efflorescence**; to seal fire, smoke or water damage; to condition excessively chalky surfaces; **or recommended for application to exterior wood or wood-based surfaces, or for highly alkaline cement, plaster, and other cementitious surfaces**. An excessively chalky surface is one that is defined as having a chalk rating of four or less as determined by ASTM Designation D 4214-98 Photographic Reference Standard Nop.1 or the Federation of Societies For Coatings Technology " Pictorial Standards for Defects"

Recommended changes are underlined and highlighted in **bold type**

(Note: The revised Specialty Primer definition clarifies further the need for specialty primers for all highly alkaline surfaces, not just green concrete.)

In addition the TOS should be revised to reflect the addition of the three specialty categories that the OTC AIM Work Group have been recommended be included: Conversion Varnish; Thermoplastic Rubber Coatings and Mastics; and Impact Immersion Coatings.

Attachment B

Calculation of VOC Emission Reduction
Obtained from Implementation of NPCA Recommended Table of VOC Limits

The NPCA used the same methodology used by the OTC AIM Work Group to determine the percent VOC emissions reduction from the current National AIM Rule. This methodology is outlined on pages 15 and 16 of the Pechan Report and included the use of the same Excel spread sheet that the OTC Work Group used.

Using this methodology the NPCA Recommended Model Rule is estimated to provide a 21 % VOC emissions reduction beyond the National AIM Rule. We used constant solids at the limit as the OTC work Group did.

The following formula was used to account for proper baseline conditions:

NPCA Recommended Rule% reduction after EPA rule = ((NPCA rule % red from 1990 base - EPA rule % red from 1990 base)/(100-EPA rule % red from 1990 base))*100%

=(37-20/100-20)*100
= 21%

or another way of calculating using pounds is as follows:

1990 baseline emissions = 758,338,092 lpy emissions
% red from EPA rule from 1990 base = 20 % =606,670,474 lpy emissions
% red from NPCA Model rule from 1990 base = 37% = 479,648,843 lpy emission

% red = ((606,670,474 – 479,648,843)/606,670,474)*100%=21%

The credit for the NPCA Recommended AIM Rule relative to the National AIM Rule was computed as follows:

Post NPCA AIM Recommendation control = 5.36 lbs/capita [1-(0.21)(1.00(1.00)]

= 4.23 lbs/capita

which is nearly 70 % of the reduction per capita that would be garnered from the OTC AIM Model Rule.

In fact, we believe, that if the OTC states join industry in a cooperative survey of AIM product sales in the OTC region, we will find that the emissions per capita will be substantial less than projected 4.23 lbs. We base this prediction on what has happened in California. . There sales of AIM products have increased but both the total annual emissions of VOC from AIM products and the emissions per capita have been reduced. All this happened during a time period (1990 to 1996) in which no new AIM VOC controls were implemented. This only go to reinforce our long held position that marketplace preference for waterborne coatings along with the continued introduction of new coatings technologies will continue the decades long trend in reduction of VOC emissions from AIM products.

August 30, 2001

National Paint & Coatings Association

Gene Pettingill
Regulatory Officer
Delaware DNREC
715 Grantham Lane
New Castle, Delaware 19701

Robert R. Thompson
Hearing Officer
Delaware DNREC
R&R Building
89 Kings Highway
Dover, Delaware 19901

Dear Mr. Pettingill and Mr. Thompson:

I am writing on behalf of the National Paint and Coatings (NPCA) to provide comments concerning the proposed adoption by Delaware of VOC limits for architectural and industrial maintenance coatings (Proposed Regulation No. 41) which is based on the rule approved by the Ozone Transport Commission.

I. INTRODUCTORY COMMENTS CONCERNING NPCA's INVOLVEMENT WITH DEVELOPMENT OF THE PROPOSED RULE

NPCA has been extensively involved in discussions with the OTC and individual state agencies and officials during the OTC's consideration of the model regulation.

The OTC's official consideration of an AIM rule based upon the California Air Resources Board's (CARB) AIM Coatings Suggested Control Measure began last summer.

NPCA Extensive Comments and Involvement: NPCA and its member companies have provided extensive comments to the OTC working group and its designated lead agency official, Mr. Sliwinski of the New York Department of Environmental Conservation (DEC), throughout the process and we have met with your office and other state agency officials . We have done so in an effort to provide you with information that allows you to make an appropriate decision concerning the extent to which coatings technology will permit the lowering of VOC limits for AIM coatings below those specified in the national AIM coatings rule, without compromising performance and cost effectiveness.

Our several meetings with the representatives of the OTC in our building and elsewhere involved discussions with technical experts from our companies which sought to provide information that demonstrated why the industry did not believe that the CARB SCM should be adopted by the OTC as a model and why alternative standards that we offered should be adopted instead.

During the August 23 hearing in Dover, Mr. Sliwinski, the designated lead state representative on the OTC AIM coatings work group, suggested some of our points had not been raised before, mentioning our concerns about floor coatings. This gave us pause. As you can see from the attached August 21, 2000 submission to Mr. Sliwinski, we specifically raised technologically feasibility concerns about floor coatings, among others. (See Attachment D for August 21 comments. Detailed floor discussions in attached submission to CARB.) It was raised by submitting to the OTC our comments to CARB on its SCM because OTC representatives had made it clear that they were relying in major part, if not exclusively, upon the CARB record for the OTC recommended rule. This was made even clearer when Mr. Becker of STAPPA/ALAPCO who attended most of the meetings and participated as if he were a designated OTC representative asked at our first meeting, "If CARB did not believe you, why should we?"

I hasten to add that Mr. Sliwinski's forgetfulness that evening about what was in the August 21, 2000 submission was understandable oversight in light of the great deal of information that has passed through his hands during this exercise. But the point is we did raise the issue and others as well concerning technological and commercial feasibility. Pictures of paint failures, panels of the type that were shown at the August 23 hearing, written submissions, oral testimony of coatings experts describing in great detail the technological issues, etc., were provided during the OTC's development process. Many facts were provided that amply demonstrated the technological and commercial feasibility problems associated with the CARB SCM/STAPPA proposal.

We have maintained from the beginning of this exercise with the OTC and now with individual states, that there are significant technological feasibility problems with the SCM limits and the conclusions of CARB with justifying the limits. In our view each OTC state is obligated to go behind the CARB record and reach its own independent determinations concerning the technological feasibility and commercial feasibility of the limits it adopts.

In this connection the exchange between Mr. Thompson and Mr. Sliwinski at the hearing concerning answering the points made by Ms. Harding of Sherwin Williams about the difficulties presented by low VOC waterborne materials and wood floors is instructive. In answer to Mr. Thompson's query about how Ms. Harding's issues might be answered, Mr. Sliwinski said that applicators may have to find ways to work around the temperature and humidity problems raised by Ms. Harding's presentation. Mr. Thompson in response expressed concerns about the commercial feasibility of such an approach.

In this same vein, an examination of the record compiled by Delaware shows that many of our real concerns about the practical implications of the mandated coatings technologies are similarly relegated to "it'll work out" or the technologies will be there to solve the problems. On the last point it must be noted that the Delaware record often contains references to OEM coatings technology, especially with respect to wood coatings, e.g., the references to Fuhr and Cash coatings seem to apply here. As Sherwin Williams points out in its comments, references to OEM coatings for future available technologies for field applied coatings is inappropriate. OEM coatings are applied under much more controlled circumstances than field applied coatings – the environment of application can be better

controlled for temperature and humidity, the substrate is a known commodity, the applications are assembly line like and supervised, and there is a much wider selection of chemistries available because of the controlled environment, including ones that safety considerations prevent form being used in a home or similar setting.

Also the record has no discussion of the time frames involved with developing, field testing, and bringing to market a new field applied coating. These can be as long as five years. Even reformulations of existing technologies may require such testing before they can be confidently applied. Bear in mind, if a field applied coating fails or proves to have unanticipated harmful properties that only show themselves over time, the failure can be widespread and catastrophic. Here again is a key difference between OEM coatings -- while failures here are no picnic, at least they are confined and thus more readily addressed. These kind of very practical, real world issues are not examined in the record. Technologies in their early stages of exploration, such as soybean based alkyds, are cited as well and this practice too is a highly questionable basis on which to establish a rule that would eliminate so many of our important coatings from the market.

NPCA's Alternative Table of Standards: We have submitted a Table of Standards that secures significant reductions in VOC emissions. (See Attachment A.)

Our calculations demonstrate that our suggested limits will secure approximately 70% of the VOC emissions reductions that are assumed by the OTC to be secured by its suggested Table of Standards. (See Attachment B.)

We say assumed, because it is our conviction that several of the limits in the Delaware proposal are so low as to compromise coatings performance such that more coatings will be used more often and thus will result in higher, not lower, VOC emissions.

It is our understanding that Delaware and many of the OTC states are seeking additional VOC emission reductions in order to meet SIP requirements mandated by US EPA which include adoption of regional control measures. A certain regional VOC emission tonnage reduction target is being sought and the proposed AIM rule apparently would meet a certain share of it. It is clear, however, that EPA does not intend by that SIP mandate to obtain only "on paper" reductions. As we have stated throughout this process and restate here, the limits that would be adopted will be counter productive to lowering VOC emissions reductions because they will result in eliminating from the market effective coatings and will result in more painting.

Our Table of Standards has concentrated on providing suggestions for lower limits in the large volume coatings categories. We also believe, however, that a number of the low volume, niche market or specialty coatings that are recognized by the national AIM coatings rule but not by the OTC model regulation should be adopted by Delaware. In this connection, it is important to note that two such coatings – conversion varnishes and thermoplastic rubber repair coatings and mastics – have been recognized in the post OTC recommendation period. Also, John Elston, the Director of Planning for the New Jersey Department of the Environment and the head of the OTC Stationary Source Committee, in

reporting on the work of the AIM workgroup to the full Commission at its Summer 2001 meeting in Newport, Rhode Island, cited adoption of the thermoplastic rubber repair coatings and mastics as an example of where the situation and climate conditions in the Northeast are such as to necessitate departure from a regulation that was developed by California. The key issues in deciding whether to recognize the niche coatings should be the need for them, effective alternatives, if any, and the reasonable assurance that the nature of the coatings, their costs, or their distribution are such that it is unlikely that they will become coatings of general application. We set out a number of coatings that we believe qualify for this and sincerely hope that they will be recognized in the final Delaware regulation.

We also have asked for the inclusion of an averaging provision that would allow higher VOC products to be sold so long as their excess emissions are adequately off set from lower VOC emissions of products that go beyond compliance limits. We understand that some concern has been expressed about the enforceability and administrative difficulties of such an approach. It is note worthy that the OTC Consumer Products Model Rule includes not only an averaging provision but also an innovative products provision and a variance provision. It is difficult to understand how this can be afforded one group of consumer products and not another. At the hearing Mr. Pettingill justified the distinction on the grounds that the consumer product rule is "technology forcing" while the AIM coatings rule is not. We disagree with this and believe that the distinction is not supported by any substantial evidence on the record and is arbitrary and capricious. We make a similar request and on the same grounds for a variance and innovative products provision like the provisions in the consumer products rule.

Detailed discussions and information on these matters and others are provided below or are attached.

We think it is important to recognize that our industry has worked hard to convey our deep concerns and reservations about the rule Delaware has proposed. To date, we have seen very little recognition of these concerns. We hope that this will serve to convince you and others that there are very real problems in adopting the OTC Model Rule. It is based upon a California Air Resources Board rulemaking, which we do not believe has established a sufficient factual record for the limits it specified even for California and its much milder climatic conditions.

Future Technology: We recognize that the limits will not become effective until 2005 and that an industry like ours can be expected to continue to push its R&D toward lower VOC products. Our current suggested Table of Standards represents the consensus industry view of where we believe technology will be in 2005.

In approaching this very complex area we suggest that as a practical matter a great deal of the issue turns upon the degree to which lower VOC waterborne coatings can replace higher VOC waterborne and solventborne materials. (See Attachment C.)

As we stated in our December 11, 2000 letter to Mr. Sliwinski as a practical matter the lion share of the lower VOC emission reductions gains from AIM coatings will largely come from some type of waterborne coatings technology in the high volume coatings categories.

It thus is worthwhile to review in the record the materials that relate to the differences between the two. In this connection the materials from the Rohm and Hass Spring Hill meeting (Items 66 and 67 in Delaware record) are useful, as is a 1992 presentation made by Carl Minchew of Benjamin Moore during the EPA AIM Rule Reg-Neg process (included in these materials). Also the article written by Rusty Johnson a manager of Rohm and Haas which is included in my December 11, 2000 letter to Mr. Sliwinski. (See Attachment D.)

In reading the Johnson article, you should realize that while Mr. Johnson refers to "solvent free" latex coatings at one point the, the article is more general and applies to "low solvent paint makers".

We do not oppose the technology.

Besides the wrong headedness of such a stance, too many of our members use it for us to oppose it. Our worry and our members worry is that the technology is being pushed too far, too fast by the proposed rule to a point where our members cannot make effective waterborne coatings.

Two of the major industry representatives at the August 23 Dover hearing, Sherwin Williams and Benjamin Moore, who spoke against certain limits in the rule are major suppliers of waterborne coatings. In fact Mr. Pettingill cited some of their waterborne coatings in support of adopting the proposed rule.

Surely basic market incentives (customers prefer the coatings) and economies of scale (why maintain different coatings technologies when one would do) would lead these companies to support the rule in its entirety if they thought that all of the existing solventborne and waterborne systems could effectively be replaced by the waterborne systems mandated by it.

Here are some of the reasons they do not. A review of the product data sheets for the waterborne exterior and interior coatings systems at the VOC levels of the proposed rule demonstrates some fairly consistent restrictions and limitations on their use. They cannot be applied in temperatures at or below 50 degrees or when such temperatures are expected in 24 hours after application. For the "zero" VOC materials the restrictions are more acute. Also many caution against application in certain humidity conditions. To mention just two very significant impacts of limiting the availability of such coatings to these VOC limits – there will be a greatly truncated painting season which will have significant economic consequences for painters and developers and more of the painting will have to occur in the relatively higher ozone forming months which will have an impact on ozone formation. Also any out side emergency painting (e.g., storm damage to a home) during the winter months would be severely circumscribed if not eliminated.

Mr. Johnson works for one of the leading companies supplying waterborne systems and thus has every incentive to say that eventually the problems he identifies with low VOC waterborne coatings will "disappear". Nonetheless, this knowledgeable expert concludes the article by saying only that they will "diminish" over time.

This is more than just "judgment" about uncertain but expected, or probable breakthroughs in our resin and coatings technology. Rather, it is based on what is known about the fundamental chemistries of coatings from which all innovations will have to come.

- waterborne systems will never be able to have all of the properties of an alkyd system, and vice versa

- even waterborne systems require a certain level of solvent for adequate performance in certain application and exposure environments and storage situations

- climatic conditions in the Northeast have far more impact on the majority of coatings applied than those of California because the high population centers of the Northeast are subject to more extreme weather conditions than those in California (it snows in the Sierras, it does not snow in LA and San Francisco and in no place in California are there widely divergent seasonal temperature/humidity/ freezing annual conditions that regularly occur in the Northeast

- water has a definite detrimental effect when in direct contact with wood and waterborne systems have these effects

- low VOC two pack systems effectively meet a number of important application requirements but are completely cost prohibitive substitutes for general coatings requirements

- low volume coatings that serve a niche market will not increase in volume beyond the specialized demand for which they were developed because they are completely ill-suited for other uses.

In our view, adoption of the VOC limits of the proposed Delaware rule would not be supported by substantial evidence and in fact would fly in the face of contrary substantial evidence.

II. LIMITS ARE NOT SUPPORTED BY SUBSTANTIAL EVIDENCE

As alluded to above, the OTC effort has been largely based upon the record that was compiled by CARB during its development of its Suggested Control Measure (SCM) for AIM coatings.

There is no evidence that the OTC in making its recommendation independently and critically reviewed the record that was established by CARB for the SCM. Our review of the record compiled by Delaware suggests that Delaware has not undertaken such an adequate review either.

As stated previously , we submitted substantial information both orally and in writing during the OTC deliberative processes challenging many of the findings and conclusions of the CARB decision making and its record. Again we urge you to review them and our arguments concerning them to determine whether the conclusions reached by CARB on the basis of its studies and findings provide sufficient substantial evidence for Delaware to underwrite the same technical conclusions.

With respect to the testing and studies that were relied upon by CARB we noted that the tests were not adequately performed or were initial laboratory tests that cannot be relied upon for decisions about a coatings efficacy without further testing through field applications and exposures. In this regard we are concerned about the manner in which the continued tests are being conducted in the SCAQMD. (See Attachment E.) In our view these are more in the nature of technology assessments than conclusions based on well performed tests.

More importantly we are concerned that Delaware apparently plans to rely upon the tests and experience of the SCAQMD and California with lower VOC coatings in determining whether it should revise any of the limits before they become effective.

It is likely that many of the problems that we expect to be associated with the lower VOC coatings in the Delaware will not be as acute as in California because of more favorable weather conditions and because the averaging that is allowed in the California rule will mask technology issues. Under the California averaging provision a home owner would be able to get a solventborne coating when needed. It's ironic that Delaware takes the position that because it expects to know whether there are any problems with the limits from the California experience there is no need for averaging in its rule and yet the very averaging that is allowed in California will mask problems with the limits.

We request that the Delaware rule include a provision for requiring independent technology assessments and tests before the limits become effective.

There are exposure tests that are now being conducted by the SCAQMD. The initial results of these tests confirm that lower VOC waterborne coatings in crucial areas such as stain blocking for wood and industrial maintenance for corrosion resistance have performed poorly in comparison to higher VOC coatings.

We have attached a position paper which raises these and other questions about staff's report to the SCAQMD Board concerning the technology assessment. One of our comments is particularly relevant to the issue of floor coatings which will be discussed in more detail below. It notes that the Master Painters Institute's survey of available coatings has no coatings listed for floor coatings at the VOC level of the Delaware proposal except

for concrete that is not subject to water penetration from below. (See Attachments E and H.) Coatings listed for high traffic areas like stairs and steps and wood porches all have VOC levels at or above 350 grams per liter.

Pechan Report: We have several concerns about the Pechan Report which was specifically commissioned by the OTC states for this exercise.

First the study is not a comprehensive survey. It is not based upon actual Northeastern sales data of the several companies that submitted information. Rather it relies upon product data sheets of the various companies' product lines without any associated information of the degree to which, or if any the products are actually sold in the Northeast.

Moreover the figures for the compliant coatings are based only a count of reported coatings categories, not of the volume of coatings in those categpories. In this sense it commits a similar mistake made in the CARB analysis of the California survey data. It looks to whether there are products in a broad coatings category that meet or are below the proposed VOC limit and assumes that such "availability" of compliant products in that category automatically means that the remaining percentage of higher VOC products can readily be replaced by the compliant products.

Similarly the OTC's Preamble to the recommended rule states the following about "feasibility" :

> It should be noted that a substantial number of coatings exist that comply with the VOC content limits for each product category. Therefore, while some product manufacturers may need to reformulate in order to comply with the VOC limits, the model rule was developed at a level where a significant number of complying coatings already exist in the marketplace.

A broad category of coatings can include ones that can be very low VOC because of their particular application and performance requirements. Some times they can constitute a large percentage of the coating category. But this does not mean that they are suited for all the requirements of that broad category. Even the "qualitative" figures of the Pechan report suggest the opposite of what the Report implies. The Report states "when averaged across all categories, the percentages of products compliant with the OTC Model Rule is 39 percent." It is difficult to understand how such a conclusion supports the notion that compliant products should be readily available by 2005 for all of the application and performance requirements currently being met by the remaining 61 percent. Our industry since the end of World War II has relentlessly pursued lower VOC waterborne coatings such that now 80 percent of the AIM coatings are waterborne. Logically, this 61% of higher VOC products still in use should raise questions about the technological and economic feasibility of mandating lower VOC limits for these higher VOC coatings. There is no such inquiry reflected in the record.

Also, the analysis that has been conducted generally by the OTC AIM coatings workgroup concerning VOC emission reductions that would be associated with additional VOC limits beyond those of the national rule has understated any such reductions because of reliance on the California AIM coatings survey data. This is so because the AIM coatings sold in California are generally lower than those sold in the Northeast due to longer lived regulatory controls. A more realistic determination would be based upon the usage in the Northeast. Reductions that would be achieved by adopting our suggested Table of Standards should be evaluated in that light.

With respect to the Aberdeen Proving Ground Study that is cited in the record (Item 62 in the Delaware Record), the companies that supplied the majority of the coatings used in the study – Sherwin Williams, Benjamin Moore, and Duron – oppose the proposed rule and support the NPCA alternative. While these companies make waterborne coatings they realize that they have certain application and performance limitations. Additionally, it is our understanding that the Aberdeen program allowed for variances from the waterborne systems. To fully understand the implications of the Aberdeen experience this should be looked into and it should be determined whether the variance was used and why. Its mere existence demonstrates that waterborne systems cannot do it all. Finally, a practical point. A military base differs greatly from a civilian environment, both in the selection of coatings that are allowed and the ability to control the timing of when painting can occur. Having been raised in the military and with a two year stint in the Army, I know that even the general's wife does not get to freely select the coatings for her husband's office or their home.

III. SPECIFIC TECHNOLOGY FEASIBILITY ISSUES

A. General Coatings Categories

Below we summarize some of the coatings specific information that we conveyed in our presentations to CARB and the OTC workgroup as to why we believe that higher VOC limits are required for certain coatings.

Exterior Flats: OTC Model Rule – 100 grams per liter; NPCA Table -- Exterior coatings – 150 g/l; (Interior coatings – 100 g/l)

Exterior flat coatings require a higher VOC limit of 150 g/l primarily because of weather and color considerations.

Many companies make a low temperature exterior flat coating that can be applied in weather conditions below 35 degrees and it requires a VOC level at or above 150 g/l. This allows painting during the early spring and late fall – the non-ozone forming months.

Additionally, freeze thaw requirements in the Northeast – the ability of a liquid coating to under go freezing but retain its efficacy -- is threatened by a VOC limit of 100 g/l. In an

ideal world, to provide completely adequate protection for freeze/thaw, the VOC limit in fact should be 200 g/l.

Finally, certain colors (bright and masstones) need a higher VOC limit in order to allow sufficient pigment loading which is needed to get sufficient hiding and develop full color.

The bright organic colors such as phthalo blue, phthalo green, carbon black, bright reds and yellows require dispersion in order to obtain maximum efficiency. These pigments are of a very fine particle size, which means they have a large surface area and a high oil demand for proper wetting and dispersion. In order to properly disperse the pigments, dispersion is normally obtained by making 2 to 3 passes in a sandmill. A ball or pebble mill may also be used to disperse the pigments. Since operation of a sandmill or ball mill is time consuming, several companies have specialized in the dispersion and sale of these dispersed colors.

Purchased organic shading pastes usually contain high levels of VOCs since the pigment concentration of the organic pigment varies between 20 to 40% in water based toners, and 17 to 35% in solvent based toners.

Shading pastes are used to produce pastel and midtone colors. If a company has low sale volumes for bright organic colors, they may decide not to invest in purchasing a sandmill and tying up equipment for 6 to 8 hours to generate 1000 or 2000 gallon batch of bright colored paint. An alternative is to manufacture a deep or neutral base that can be shaded with high levels of organic shading pastes. In the process, this will generate the low volume products needed for completion of a product line, but it will significantly increase the VOC level of the finished product.

In order to product bright organic colors in a flat latex coating would require a higher VOC limit that what is proposed. Some of the water based shading pastes contains glycols to prevent freezing of the material during transport.

The use of averaging for a product line would allow the bright colors to be produced and still keep the product line within the parameters of the VOC limits.

Most companies will produce product lines that consist of multiple tint bases. The primary variation within the tint bases is the level of titanium dioxide. White base will have high levels of titanium dioxide (TiO2). Midtone bases less TiO2, deep bases even less, accent bases very little TiO2 and neutral bases no titanium dioxide. With the various tint base TiO2 levels, a company can produce upwards of 1500 colors with five bases for each product line, thereby giving the customer a varied color choice with very few units in stock. In the process of developing the deeper tint bases, the formulators need to have the flexibility to modify the formulas to retain the proper characteristics of the various product lines. Most universal colorants used in stores contain glycols that are universally acceptable in latex and solvent systems. Since glycols are extreme slow evaporating, the higher the level of colorant, the longer the dry time. The following list is an example of the amount of universal colorant needed to shade a gallon of each type of tint base:

- White bases = 2 ounces per gallon,
- Midtone basses = 4 ounces per gallon,
- Deep bases = 8 ounces per gallon,
- Accent bases = 12 ounces per gallon, and
- Neutral bases = 12 ounces per gallon.

In order to develop a product that will satisfy the end user, the coatings formulators need the flexibility of modifying the formulas so that the properties of the deep color bases will approximate the characteristics of the light color bases. This usually means that either a different resin (harder type – latex coatings) or different ratios of solvent based resins must be incorporated in the formulas. With the latex systems a harder resin requires higher coalescing solvents must be used in order to help the resin cure. Without the coalescent solvent, the film would not properly cure, causing slow dry and early failure.

Zero VOC latex coating utilizes a resin that contains no coalescent solvent or glycol (anti-freeze). The resin is usually soft and cannot be used in formulations below a white or pastel base. Midtone, deep, accent or neutral bases in a zero VOC are currently unattainable due to the limits of the latex resins. In order to produce the deep color bases, harder resins must be used which require coalescent solvents.

In addition to the problems mentioned above, coatings made for consumer consumption must be stable. Latex coatings need to be able to withstand a slight freeze without gelling and not be able to be reincorporated. This requires the formulator to properly balance the various components within the formula. Some of the ingredients that allow for dispersing the pigments and defoaming the coating upon application may contain low levels of VOCs that eventually have to be incorporated into the VOC calculations. Other ingredients used for biocide protection in the can or fungicidal protection of the applied coating on exterior application may also contain VOCs. Without these ingredients, the latex products are subject to bacterial contamination in the can and for exterior coatings, early failure for mildew protection. Without these protections, the coatings are subject to early failure and therefore early recoating. By early failure, the surfaces would require early repainting, thereby increasing the levels of VOCs emitted. By using a correctly formulated product designed for specific applications with the proper VOC level, the overall effect would be an initial higher VOC emission, but over the long term, less recoating and therefore lower VOCs emitted in the long term.(See Attachment F for discussion the impossibility of providing a complete color line with the Delaware limits without averaging.)

This is a complicated subject and probably requires a face-to-face dialogue with industry experts to be fully understood. We would welcome the opportunity to supplement the record on this score.

Non-Flats: OTC Model Rule – 150 grams per liter; NPCA Table -- 200 g/l

There continues to be a freeze/thaw issue with any waterborne coatings below 200 g/l. Moreover the higher quality paints – coatings with more resin material and solids that

thereby provide better film build and longer durability -- will suffer due to a decrease in open time effecting flow and leveling, appearance and hiding (i.e., the paint will dry too quickly given its relatively high level of solids.) As we have stated in many of our presentations to the OTC, this is another effect of the OTC model rule that could produce higher VOC emissions by increasing repainting and driving longer lasting, higher quality products from the market, Also it has been found that at less than 150 g/l, latex non-flats have a tendency to "skin" in the can more than paints at 200 g/l. Bear in mind also that at 200 g/l, the materials will all be waterborne. What is being requested here is the ability to make high quality waterborne non-flat coatings which have good freeze/thaw stability and allow for the manufacture of high quality thicker filmed products which in the short and long run lower overall VOC emission levels.

The discussion concerning the requirements of bright colors above applies here as well, only more so because of the additional gloss requirement. In this connection it is important to note that at the Rohm and Haas demonstration at its Spring Hill facility, the materials that were being tested clearly showed problems with discoloration with the darker colors. Additionally, these panels had higher VOC coatings than the 150 g/l limit.

Non-Flat High Gloss: OTC Model Rule – 250 g/l; NPCA Table – 380 g/l

In order to achieve a gloss as defined in the OTC Model Rule, a solventborne or alkyd coating is required. A review of the Master Painters Institute's list of products indicates that all of the listed products for this category -- Interior Alkyd, Gloss – have VOC levels at or above 380 g/l. (See Attachment G.) The limit that is specified in the OTC Model Rule would therefore rule out the use of alkyd systems altogether for this important coatings category.

Thus the rule will essentially outlaw certain "models" of products. The alkyd gloss enamels under discussion here are the standard of this type of product because they have the highest gloss, dry relatively quickly, have good corrosion resistance and have been accepted by a large number of customers (especially contractors). To change the rule from 380 g/l to 250 g/l for gloss products essentially outlaws alkyd enamels; it is impossible to make an enamel that would dry quickly enough, be hard enough, and not yellow severely at 250 g/l. The alternative latex gloss products are inferior to the alkyd enamels for the properties stated above. No other types of products where emissions have been a problem have been forced into discontinuance.

Floor Coatings: OTC Model 250 g/l; NPCA Table 250 g/l for waterborne; 380 g/l for solventborne

This is another issue concerning applications that are appropriate for waterborne and those that are not. The Master Painters Institute for example limits waterborne floor coatings to concrete for which there is no possibility of water penetration from below, wood floors and porches without high traffic, and it never recommends them for garages because the hot wheels from arriving cars will lift the coating. For these applications, solventborne coatings are required. (See Attachment H.)

Specialty Primer: NPCA Alternative Would Expand Definition

The NPCA Alternative proposal would expand the definition of "specialty primer" to include blocking of "odors and efflorescence" and recommended applications to "exterior wood or wood-based surfaces or for highly alkaline cement, plaster, and other cementitious surfaces. All bare wood surfaces present special requirements for primer adhesion and blocking. Unprimed wood siding often comes with saw "burns" where the saw in cutting the wood has in places seared the sap or resinous material of the wood such that it leaves it with a hard surface that only a solventborne product can penetrate for good adhesion. Wood products siding comes from an amalgam of materials such that it is difficult to determine whether or where there might be bleed through tannins. Additionally, these materials are notorious for edge deterioration when a solventborne primer is not applied. See Sherwin Williams comments.

Also for the record, it should be noted that for a stain blocking primer, the ideal VOC level for consumer application ease is 400 g/l per liter. This is so because such materials are necessarily extremely viscous in order to provide the necessary blocking properties. In this connection we draw your attention to the product data sheets of ICI that were mentioned at the August 23 Dover hearing. The waterborne primer data sheet for the waterborne primer Aquacrylic Gripper states in its Directions for Use, Application: "Some highly water sensitive stains may require the application of solventborne Stain JAMMER 110 for best results." (See Attachment I.)

Also with respect to the odor barrier requirement, ICI markets an Interior Vapor Barrier Latex Primer-Finish but it notes in its Directions for Use, Application that "multiple coats may be required to obtain recommended film thickness to achieve vapor barrier properties". (See Attachment J.) If this amounts to four coats, the application's VOC emissions would exceed the one coat application of the 350 grams per liter solventborne specialty primer we are recommending. The point is that the ICI coating information suggests that vapor/odor barrier requirements are not easily handled with ordinary applications of one or even two coats of waterborne coatings. Also it should be obvious that the demand for an odor barrier coating would be quite small.

As to blocking efflorescence, this is caused by the interaction of water soluble salts and minerals in walls bleeding out because of water contact. It seems intuitively obvious that a waterborne product would not be the ideal product to handle this problem.

Quick-Dry Enamels and Primers: Enamels OTC Model 250 g/l; NPCA Table 380 g/l; Primers OTC Model 200 g/l; NPCA Table 350 g/l

There continues to be a need for quick-dry coatings, particularly in the Northeast for cold , inclement weather- threatening conditions. Among the most important requirement is an exterior application during the winter months, where it is necessary for a coating to dry quickly, before rain, sleet, snow, etc., sets in. While not a high usage coating in comparison to the general flat and nonflat coatings, when it is needed it is needed, e.g.,

repair to storm damaged structures during the winter months in which the siding must be coated to protect it.

Sanding Sealers: OTC Model 350 g/l; NPCA Table 550 g/l

Sealers: OTC Model 250 g/l; NPCA Table 350 g/l

Stains: OTC Model 250 g/l; NPCA Table Opaque 350 g/l; Clear and Semitransparent 550

Varnishes: OTC Model 350 g/l; NPCA Table 450 g/l

In this connection we endorse the comments made by Sherwin Williams, Valspar, Cabot, Inc., and Benjamin Moore which are attached. You will note that Valspar's comments raise the issue of whether even higher limits are necessary than we are recommending. Paul Sara, the Technical Director of Valspar, has been formulating coatings for over twenty years and raises cautionary issues even about the limits that we are recommending. (See Attachment K.)

Lacquers: OTC Model 550 g/l; NPCA Table 680 g/l

The limit of 680 g/l is necessary in order to avoid having to formulate lacquer coatings with the exempt solvent acetone. Acetone has an extremely low flash point as compared to other solvents and thus carries a greater danger in its use. That lacquer requires relatively a higher amount of solvent than other products to work is unquestioned. Even the STAPPA/SCM and the Delaware proposals recognize a limit of 550 g/l. Moreover the SCM and the SCAQMD Rule 1113 allow even higher limits for cold weather and humid conditions applications. The issue is whether the material will be made out of safer materials in light of its wide use in many different environments. Additionally, according to industry experts, the 550 g/l limit being met with acetone also results in the spraying of additional coating, conservatively as much as 15% to 20% more. This is caused by the relatively rapid evaporation rate of acetone which requires more coating to ensure a complete wet on wet film is applied on the object before it is allowed to dry to obtain uniform appearance (prevent lap marks where material dried before the material next to it is applied.)

B. <u>Niche Market Coatings Categories</u>

The following niche market coatings, extremely low volume but relatively high VOC coatings, are for very specific application requirements and are recognized by the National AIM Coatings rule should be included in the rule. These coatings have been developed for unique, low volume coatings requirements, as exemplified by calcimine recoaters which are used exclusively for calcimine plaster walls and ceilings found in older homes. We believe that they should be included in the Delaware regulation at the VOC limits specified in the national AIM coatings rule.

It should be noted that the EPA found that such coatings constituted a minimal volume of AIM coatings. Their unique application and performance application properties, as well as their cost, insure that they will not be used for general coatings application. Individual companies which make these coatings have submitted comments with which we concur. From a policy perspective it would be completely counter productive to eliminate effective, needed coatings, which do not contribute in any significant sense to ozone formation.

Concrete Curing Compounds
Concrete Protective Coatings
Concrete Surface Retarders
Waterproofing Concrete/Masonry Sealer
Alkaline Issues for Specialty Primers

Please consult the comments of Textured Coatings of America and PROSOCO at Attachment K. While the comments confine themselves to the Waterproofing Concrete/Masonry Sealer, Concrete Protective Coatings categories, and Alkaline Issues of Specialty Primers the discussions also may support concerns about the recommended limits for Concrete Curing Compounds a Concrete Surface Retarders.

Anti-graffiti Coatings

Please consult the comments of Textured Coatings of America at Attachment K.

Nuclear Coatings

Please consult the comments of PPG at Attachment K.

Impact Immersion Coatings

Please consult the comments of Mr. Beitleman of the Army Corps of Engineers which we understand are being sent to you.

Calcimine Recoaters

Please consult the comments of Benjamin Moore and California Products at Attachment K.

IV. ADMINISTRATIVE PROVISIONS

The Delaware proposal should be revised to include the following provisions.

A. Averaging Provision

The Delaware proposal should be revised to include an averaging provision that is modeled after the "averaging provision" found in the South Coast Air Quality Management District Rule 1113 for Architectural and Industrial Maintenance Coatings. This provision should be administered on a regional basis or joint state bases for all the OTC states

implementing an OTC based AIM rule. The inclusion of the "averaging provision" is a key element of our alternative proposal.

The concept providing "alternative mechanisms" for compliance with VOC/ HAP content limits is an established concept. The rules for consumer and commercial products along with many other state and federal VOC/HAP rules contain averaging provisions. We urge the OTC states to reconsider their position on the use of "averaging" for architectural coatings.

We have attached a letter we recently sent to US EPA Assistant Administrator Jeff Holmstead asking for EPA's assistance in helping the OTC region states to administer such a program. (See Attachment L.)

It is also important to note that the SCM's sunset provision for its averaging is based upon the expected adoption of another flexibility mechanism that will make it technologically feasible to overall meet the lower limits at issue. See in this connection Sherwin Williams' and Benjamin Moore's comments.

NPCA also has made clear its position concerning the essential necessity of an effective averaging program to permit the industry to effectively meet the standards that we have suggested. (See Attachment M.)

B. AIM Coatings Specific Variance/Petition Provision

The rule should contain a specific provision by which manufacturers could who cannot comply with the requirements of the rule, due to extraordinary reasons beyond the manufacturers reasonable control may apply for a variance or petition for a change in the rule. The exact language of this provision will need to be discussed and agreed upon by all parties. Precedent for inclusion of this specific provision can be found in the consumer and commercial products draft rule.

C. Technology Assessment

Acknowledgement of the need for a technology assessment/review on the appropriateness of maintaining future VOC limits should be made by each of the states implementing the new AIM rule. This technology assessment should be conducted one year before lower VOC limits are to be implemented and could be administered by the OTC AIM Work Group. In conducting the technology assessment/review, the OTC AIM Work Group should consider any applicable AIM surveys and studies that have been undertaken by industry or other parties.

D. Unnecessary and Burdensome Reporting Requirements

We feel that the reporting requirements found in Section (e) (1-5) are unnecessary and burdensome and will not provide any net VOC reduction benefit to the OTC states.

If Delaware and the other OTC states determine that these extensive and costly reporting requirements are for some reason key to implementation and compliance of their AIM rules, we are recommending that these requirements be undertaken on a regional basis similar to our recommendation that the "averaging provision" be administrated on a regional basis. Another alternative way of obtaining this information would be through a periodic regional AIM survey such as discussed above.

IV. CONCLUDING COMMENT

We appreciate this opportunity to comment on the Delaware proposal. We recognize the difficulties inherent in any effort to come to grips with the complex chemistry technologies of the large variety of coatings involved. We, however, believe that a thorough consideration of the information we have presented and a realistic assessment of the CARB record and that assembled by Delaware judged in light of the requirements for the Northeast provides substantial evidence warranting the adoption of our alternative proposal.

Sincerely,

Jim Sell
Senior Counsel

Robert J. Nelson
Senior Director, Environmental Affairs

ATTACHMENT A

NPCA ALTERNATIVE LIMITS AND RULE PROVISIONS

August 30, 2001

Summary of Industry Alterative Proposal For Revision of
Delaware Draft Rule # 41
For
Architectural and Industrial Maintenance Coatings

The NPCA has developed an Alternative Proposal for the revision of the Delaware Department of Natural Resources and Environmental Control draft Rule # 41 – Section 1 – Architectural and Industrial Maintenance Coatings. This proposal consists of two types of recommended changes to the Delaware/OTC Model AIM rule: changes that will have no effect (neutral impact) on the VOC reduction credit; and changes that are being recommended due to product performance needs and requirements. The latter revisions to the draft will no doubt have some effect on the amount of VOC reduction credits that the OTC states are will be able to get from the implementation of the such a revised AIM rule.

We believe that due to technology changes and customer preference, the actual VOC reductions garnered from the implementation of this revised rule will be very close to those original projected by the OTC. To this end, the NPCA AIM Work Group would like to work with the OTC AIM Work Group on developing and conducting a VOC Content Survey of the AIM Products sold in the OTC region. This survey would provide assurance to the OTC states that VOC reductions are being made.

Rule # 41 should be revised to include the following provisions:

1. Averaging (Modeled after Rule 1113 and administered on a regional basis.

2. An AIM Specific Variance provision.

3. A scheduled Technology Assessment on the appropriateness of maintaining future VOC limits to be administered by the OTC.

Rule # 4 1 should be revised to eliminate:

1. Unnecessary and burdensome reporting and requirements found in Section (e).

If Delaware and the other OTC states find that these extensive and costly reporting requirements are key to implementation and compliance of their AIM rules, these requirements could be undertaken on a regional basis similar to our recommendation that the "averaging provision " be administrated on a regional basis.

II. Revised VOC Limits based on Product Performance Needs and Requirements

These recommended changes to the VOC Content limits in Draft Rule # 41 (and the modifications category definitions) are based on product performance needs and requirements.

The following changes to the Table 1- VOC Content Limits for Architectural Coatings should be made to the draft Rule # 41:

Coating category	Effective January 1, 2005 Grams VOC per liter (g/l)	Current OTC/DE Position
Flat Coatings		
Exterior coatings	150	100
Interior coatings	100	100
Non-flat coatings:	200	150
Non-Flat -- High Gloss	380	250
Floor coatings	250(b)	250

b (Alternate recommendation is a 250 g/l limit for waterborne and 380 g/l limit for solvent borne.)

Lacquers (including lacquer sanding sealers)	680	550
Specialty primers sealers and undercoaters (Modified definition)	350	350
Quick-dry coatings:		
Enamels.	380	250
Primers, sealers, and undercoaters	350	200
Sanding sealers (other than lacquer sanding sealers)	550	350

Stains:				
Clear and semitransparent		550		250
Opaque		350		250
Varnishes		450		350
Waterproofing Sealers		250		250
Waterproofing Sealers, Concrete/masonry	400		400	

Recommended Changes to the proposed Definitions

In order to implement the revision to the TOS, the following definitions need to be modified in Section (b) Definitions of the draft/Model rule

Nonflat – High gloss coating means a non-flat coating that registers a gloss of 70 or above on a 60 –degree meter according to ASTM Designation D523-89(1999).

Specialty primer means a coating formulated and recommended for application to a substrate to block stains, **odors or efflorescence**; to seal fire, smoke or water damage; to condition excessively chalky surfaces; **or recommended for application to exterior wood or wood-based surfaces, or for highly alkaline cement, plaster, and other cementitious surfaces**. An excessively chalky surface is one that is defined as having a chalk rating of four or less as determined by ASTM Designation D 4214-98 Photographic Reference Standard Nop.1 or the Federation of Societies For Coatings Technology " Pictorial Standards for Defects"

Recommended changes are underlined and highlighted in **bold type**

(Note: The revised Specialty Primer definition clarifies further the need for specialty primers for all highly alkaline surfaces, not just green concrete.)

ATTACHMENT B

NPCA CALCULATION OF VOC EMISSION REDUCTIONS
OBTAINED FROM ITS PROPOSED TABLE OF STANDARDS

Calculation of VOC Emission Reduction Obtained from Implementation of NPCA Recommended Table of VOC Limits

The NPCA used the same methodology used by the OTC AIM Work Group to determine the percent VOC emissions reduction from the current National AIM Rule. This methodology is outlined on pages 15 and 16 of the Pechan Report and included the use of the same Excel spread sheet that the OTC Work Group used.

Using this methodology the NPCA Recommended Model Rule is estimated to provide a 21% VOC emissions reduction beyond the National AIM Rule. We used constant solids at the limit as the OTC work Group did.

The following formula was used to account for proper baseline conditions:

NPCA Recommended Rule% reduction after EPA rule = ((NPCA rule % reduction from 1990 base - EPA rule % reduction from 1990 base)/(100-EPA rule % reduction from 1990 base))*100%

=(37-20/100-20)*100
= 21%

or another way of calculating using pounds is as follows:

1990 baseline emissions = 758,338,092 lpy emissions
% reduction from EPA rule from 1990 base = 20 % =606,670,474 lpy emissions
% reduction from NPCA Model rule from 1990 base = 37% = 479,648,843 lpy emission

% reduction = ((606,670,474 – 479,648,843)/606,670,474))*100%=21%

The credit for the NPCA Recommended AIM Rule relative to the National AIM Rule was computed as follows:

Post NPCA AIM Recommendation control = 5.36 lbs/capita [1-(0.21)(1.00(1.00)]

= 4.23 lbs/capita

which is nearly 70% of the reduction per capita that would be garnered from the OTC AIM Model Rule.

In fact, we believe, that if the OTC states join industry in a cooperative survey of AIM product sales in the OTC region, we will find that the emissions per capita will be substantial less than projected 4.23 lbs. We base this prediction on what has happened in California. There sales of AIM products have increased but both the total annual emissions of VOC from AIM products and the emissions per capita have been reduced. All this happened during a time period (1990 to 1996) in which no new AIM VOC controls were implemented. This only goes to reinforce our long held position that true market preference for waterborne coatings along with the continued introduction of new coatings technologies will continue the decades long trend in reduction of VOC emissions from AIM products.

ATTACHMENT C

WATERBORNE/SOLVENTBORNE GENERAL TECHNOLOGY DISCUSSION

Discussion of the Generic Differences in Performance Characteristic Between Waterborne and Solventborne Coatings:

During the extensive dialogue between industry and state and federal regulators over the development of new VOC regulations for Architectural and Industrial Maintenance Coatings that has gone on for a number of years, numerous discussions over the differences in performance characteristics between waterborne and solventborne non-flat coatings have been held[1]. This write-up has been prepared to provide a brief summary of generic performance difference between these two technologies that have highlighted during these discussions.

Waterborne- Performance Properties

Advantages:

- VOC emissions can be significantly lower.
- Generally easier to apply and clean up
- Excellent color retention
- Excellent caulk resistance and exterior durability
- Quick dry to touch.

Disadvantages:

- May have lower chemical and solvent resistance
- Reduced temperature resistance
- Softer film, poorer wash and scrub resistance
- Waterborne coatings are sensitive to humidity. Low humidity can cause coatings to dry extremely fast, creating craters in the final film and lap marks. High humidity can cause very slow drying times, resulting in sagging.
- Quality of application is dependent on surface cleanliness. The water's high surface tension prevents the wetting of some surface and causes poor coating flow characteristics. Surfaces with grease and other contaminants are especially prone to this. Usually require a solvent primer on unpainted surfaces.
- Emulsion coatings have poor penetration and adhesion properties on porous surfaces, e.g. wood. Lack of these qualities prevents good adhesion to old, chalky surfaces.
- Waterborne paints must be protected from freezing and applied at a minimum temperature of 50 degrees Fahrenheit.

Solventborne - Performance Properties

Advantages:

- Excellent flow, leveling and brushing

[1] One example of these discussions took place during the National AIM Coatings Regulatory Workshop , September 17, 18, 1992. (Attachment).

- Excellent film appearance and ability to produce extremely high gloss films
- Excellent wash and scrub resistance
- Excellent hardness and blocking resistance
- Able to be applied on marginally prepared surfaces
- Good stain resistance
- Ability to be applied during marginal weather conditions
- Good abrasion and burnish resistance
- Excellent shelf stability

Disadvantages:

- Generally longer dry times
- Generally poorer gloss retention and caulk resistance on exterior exposure
- Higher VOC emissions
- Solvent clean-up required
- Solvent odor
- Higher cost which limit consumer demand

MEETING SUMMARY

AIM Coatings Regulatory Negotiation Workshop
Prepared by Radian Corporation
September 17 and 18, 1992

THURSDAY, SEPTEMBER 17, 1992:

Welcome and Introductions

Barbara Stinson, Keystone Center [made the opening comments on the regulatory negotiation procedure and the history of the process that led up to the September workshop. It was pointed out that the October meeting in Chicago would be the first official Federal Advisory Committee Act (FACA) meeting.]

During the July meeting there were several technical areas identified for which more discussion and information were needed. The purpose of this workshop is to present and share information on these technical subjects.

Two areas that are not on the agenda for the September meeting are the protocol and the reg neg committee membership. A determination of committee membership is to be published in the Federal Register prior to the October meeting. The protocol will be finalized at the October meeting.

[Those present introduced themselves. The two-day agenda was reviewed.]

Presentations and Discussion of Relative Reactivity

There were three presentations on the topic of relative reactivity of volatile organic compound (VOC) species with respect to ozone formation. These presentations are summarized below. Materials used by the presenters are attached as handouts in Appendix A.

First Presentation

Dr. William P. L. Carter, Air Pollution Research Center, University of California at Riverside: Use of Ozone Reactivity in VOC Emissions Regulations. (Handout No. 1, Overhead 1)

(Overhead 2) Hundreds of different types of VOC's are emitted to the atmosphere and these differ significantly in their ability to react with nitrogen oxides (NO_X) to form ozone. Reactivity depends on several variables:

- How fast the VOC reacts with NO_X to form ozone;
- How much ozone is formed once the VOC reacts;

Discussion of Performance/Quality/Formulations of Coatings

Carl Minchew, Benjamin Moore & Company, gave a presentation on the basics of coating formulation and performance evaluation.

Paints consist of pigments, binders (resins), thinners (solvents), and additives. Typical pigments are titanium dioxide, clays, talcs, silicon dioxide, iron oxides, and organic compounds. Additives include driers, surfactants, defoamers, and thickeners. Generally, VOC's are found in solvents and, to a lesser extent, in additives.

Alkyd paint film formation, as an example of a solventborne coating, occurs through crosslinking of double bonds on a polymer backbone. The polymers are generally low molecular weight. The solvents used are mineral spirits. Driers initiate oxidation that promotes crosslinking. About 40 percent of an alkyd coating is VOC; 30 percent is solvent and 10 percent are volatile additives.

Latex paints, as an example of a waterborne coating, are two-phase systems in which latex particles are suspended in water. Film formation in latex paints is through coalescing of latex particles. The latex particles are surrounded by a layer of surfactant and suspended in water. The coalescing agent in latexes is a strong solvent that is used to soften the latex particles. Harder and glossier latexes need more coalescing agent than softer or flatter latexes. Glycols (also a VOC) are added to latexes to control drying since water evaporates quickly from thin films of paint. Anywhere from 0 to 10 percent of a latex coating is VOC. Drying must occur in the designed temperature range. The dried latex film is usually somewhat porous and remains thermoplastic so that heat may soften the film.

Coating properties decrease as the pigment to resin ratio increases:

- wet hiding;
- wash/scrub;
- stain resistance;
- burnish resistance;
- flow and leveling;
- brushing; and
- blocking (stickiness).

Solvents are sometimes blended with other solvents into a "cocktail" of solvents to achieve certain properties, such as

certain solvencies, evaporation rates, and even odors. There are four strategies for reducing the VOC content of a coating:

(1) Increase the solids content of the coating (but this may increase the cost and may hinder application);

(2) Use stronger solvents (more solvency power) such as xylene or methyl ethyl ketone (but these may increase the flammability and toxicity of the coating) (kary-butanol gum is used as a standard resin to measure solvency);

(3) Modify the resins to lower their viscosity (new technology is promising); or

(4) Use a natural drying oil such as linseed oil that is 100 percent solids (but these are not suitable for interiors because they are subject to yellowing and mildew. They are also slow drying and tend to shrink and crack over time).

Adding water is not favored by the statutory calculation of VOC because a lot of water has to be added. In a latex coating, for example, reducing VOC is only possible by doing the following:

(1) Remove the freeze/thaw stabilizers (usually VOC's) (but a paint that freezes can be ruined and will have to be thrown away);

(2) Remove or reduce the coalescing agents (but then a softer resin will have to be used); or

(3) Remove or reduce the VOC in the additives.

[A member of the audience pointed out that replacing alkyds with latexes in some applications would require the use of harder latexes and more powerful coalescing agents that are VOC's.]

Bernie Appleman notes that the discussion really applies to trade sales, not as much to IM coatings.

It was noted at the beginning of discussion that performance is easier to talk about when you know exactly what you want out of a coating, such as a bridge coating that will last 10 years. Performance is a lot harder to identify for consumer coatings and is more of a qualitative judgement made by the user. Test panels were passed around the room that demonstrated the following performance measures or performance defects:

- adhesion;
- color acceptance;
- fish eyes;

TECH Talk

Technological Challenge

Formulating low-solvent latex paints

By J. "Rusty" Johnson
Rohm and Haas Co.

The basic approach to creating a low-solvent latex paint is almost absurdly simple: eliminate the coalescent(s) from the formulation. Coalescent represents the sole significant source of solvent in a latex paint; remove it and you automatically have a "low-solvent" paint. Unfortunately, while the principle of formulating low-solvent paints is simple, putting that principle into actual practice is not.

The difficulty in formulating viable low-solvent paints revolves around film formation. For a paint film to form, binder particles must deform and fuse together. This process is easy to accomplish with inherently soft (low glass transition (Tg) temperature) binders.

They have fundamentally good polymer chain mobility, which permits the particle-to-particle molecular diffusion necessary for film formation. Harder binders lack this mobility; they must be "softened" by coalescing solvent before film formation occurs.

BALANCING FILM FORMATION & PERFORMANCE

In a low-solvent paint without coalescent, manufacturers are compelled to employ softer binders to achieve adequate film formation. The films developed, however, exhibit serious shortcomings: increased tack, decreased block and print resistance, and greater susceptibility to impact damage.

These limitations are of little concern in flat paints, which contain large proportions of hard pigment that reinforce the binder. Gloss and semigloss paints, however, do not contain enough pigment to compensate for the low-Tg binder.

ACHIEVING GOOD FILM PROPERTIES IN GLOSS PAINTS

Given the limitations of conventional soft binders, suppliers of solvent-free binders for gloss paints must compensate for the lower Tg through some mechanism-such as heterogeneity or crosslinking-that will reinforce and harden the polymer film.

For example, Rhoplex SF-012 emulsion, a solvent-free Rohm and Haas binder for interior semigloss paints, utilizes crosslinking to obtain film hardness. Unfortunately, these mechanisms all involve performance tradeoffs.

The greatest limitation of available solvent-free products and formulating approaches is the difficulty in simultaneously achieving a high level of performance in four key properties: low-temperature film formation, hardness/block resistance, scrub resistance, and freeze-thaw stability (1). Conventionally formulated paints have an advantage in this respect because the coalescent(s) (and other solvents) are fugitive. A coalescent remains in the paint only long enough for the film to form. The solvent then departs the film, which then exhibits the basic hardness furnished by the binder.

The difficulty in formulating viable low-solvent paints revolves around film formation.

The hard conventional binders supply good block resistance naturally; there is no need for heterogeneity or crosslinking. Moreover, obtaining good low-temperature film formation is simply a matter of adding enough coalescent to soften the binder at the minimum intended application temperatures.

In contrast, formulating with softer binders forces low-solvent paint makers to make some difficult choices. If they obtain good hardness and block resistance through such mechanisms as heterogeneity and crosslinking, low-temperature film formation may not be possible. In addition, the use of heterogeneity and a crosslinking mechanism typically has a detrimental effect on scrub resistance. Moreover, the absence of other solvents such as glycol makes freeze/thaw stability highly problematic.

CONCLUSION

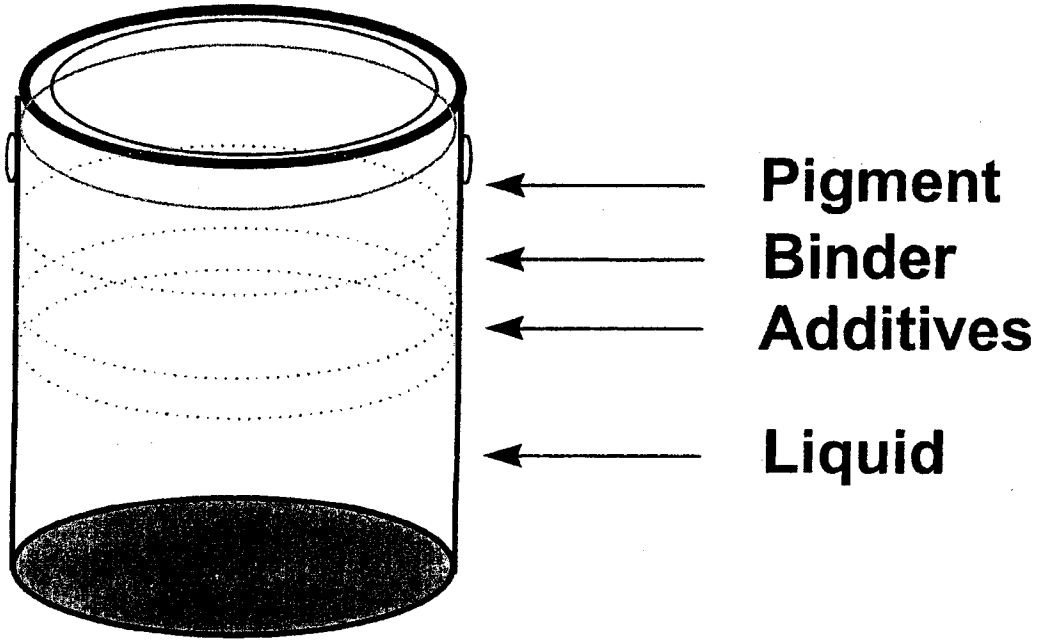
Currently, there is no way to avoid the tradeoffs involved with today's "solvent-free" latex paints. It is *therefore important to educate consumers about these compromises, so they are less likely to have unreasonable expectations.*

The point to make in this regard is that solvent-free paints represent an evolving technology. With the resources committed to their development, these products will continue to improve, and the performance gap between conventional and low-solvent chemistry will diminish. MP

J. Rusty Johnson is market manager for wall binders, North America for Rohm and Haas Co. You can reach him at 215-592-3086.

Ingredients of Paint

Basic Components of Paint



Dimensions Defining Quality in a Latex Paint

1. **Pigmentation**
   provides whiteness, color, hiding, bulk

2. **Binder**
   binds pigment; provides adhesion, film integrity

3. **Other Ingredients**
   "additives" used in making the paint

4. **Solids Content**
   proportion of pigment-and-binder to liquids that evaporate when the paint dries

Ingredients of Paint

Pigments:

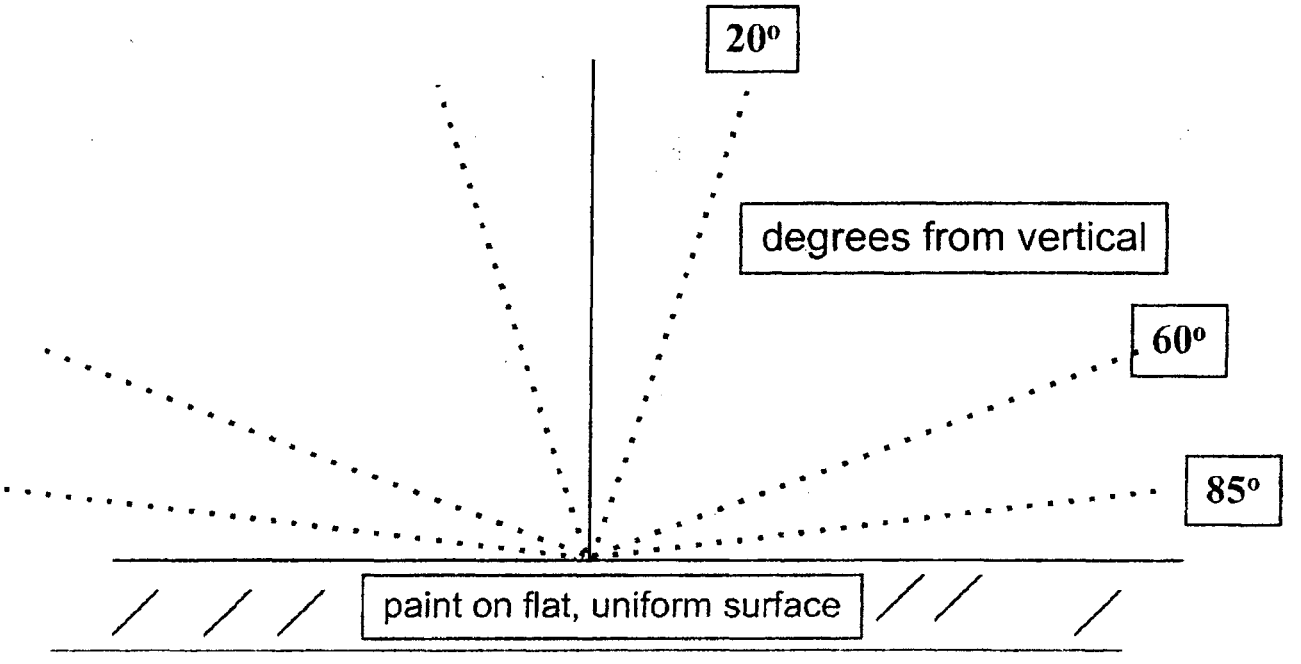
Provide Whiteness, Color, Hiding, Bulk

- **Prime pigments:**
  provide color, hiding
  (titanium dioxide, phthalo blue, etc.)

- **Extenders:**
  provide bulk, economy
  (clay, calcium carbonate, silicates, etc.)

Ingredients of Paint

Gloss Measurement Angles:



Ingredients of Paint

Gloss Levels:

Type of Paint	20° Gloss	60° Gloss	85° Gloss (sheen)
Gloss	20-90	70 - 95+	--
Semi-gloss	5-45	25-75	--
Satin	--	5-25	10-40
Eggshell	--	2-15	5-25
Flat	--	0-10	0-15

Ingredients of Paint

"PVC" (Pigment Volume Concentration) Indicates Proportion of Pigment Relative to Binder

$$\text{PVC\%} = \frac{\text{Volume of Pigments}}{\text{Volume of Pigments + Volume of Binder}} \times 100$$

Typical PVC values associated with different levels of paint gloss are:

Type of Paint	Typical PVC
Gloss	15%
Semigloss	25%
Satin	35%
Eggshell	35 - 45%
Flat	38 - 80%

Ingredients of Paint

The Paint Formulator Can Vary The Proportion of Pigment to Binder

High PVC

65%

Low Quality Flat

High Quality Flat

Satin

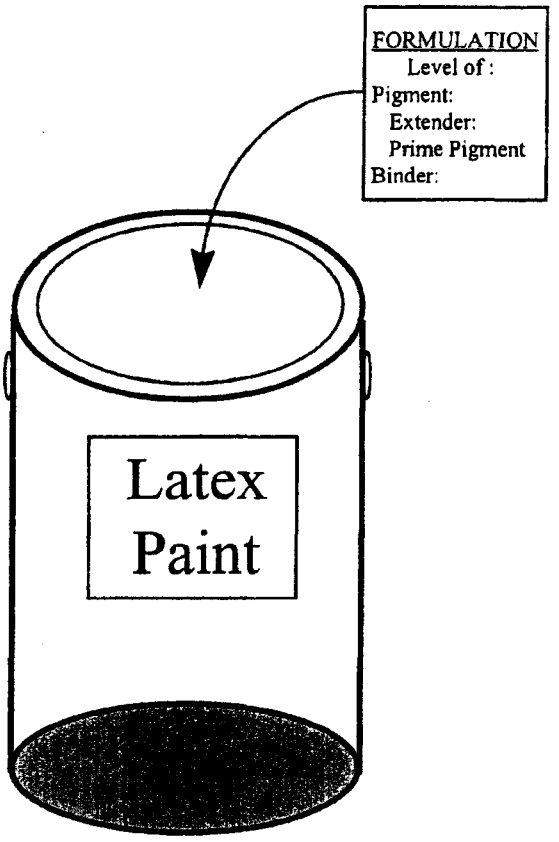
Semigloss

Gloss

15%

Low PVC

Level of Pigment Relative to Binder: "PVC"



Ingredients of Paint

Titanium Dioxide (TiO_2): Unique White Pigment: High Hiding and Whiteness,

- Wet or Dry
- Flat or Gloss

Ingredients of Paint

Color Pigments

- Organic
  - brighter
  - less hiding
  - less fade resistant exterior
  - costlier
  - phthalo blue, Hansa yellow, bright reds, violets, etc.
- Inorganic
  - many are muted earth tones
  - more hiding
  - greater durability
  - less costly
  - red iron oxide, yellow oxide, umbers, ochres

Ingredients of Paint

Liquid Colorants

- Dispersions of color pigments
  - contain glycols to deter dry-out
  - "universal" colorants are for latex and oil-based paints
  - contain surfactants for color acceptance
  - added to "tint bases" designed to accept them

Higher Levels of Colorant per Gallon ↓

- tintable white
- light base
- medium base
- deep base
- ultra deep base
- neutral base

Decreasing Level of TiO_2 per Gallon ↓

Ingredients of Paint

Extenders
(each comes in different particle sizes)

- calcium carbonate
- calcined clay
- delaminated clay
- silicas
- talc
- mica

Extenders

- Don't contribute much to light scattering and thus not to wet hiding
- Can aid hiding by spacing TiO_2 particles
- Are low-cost fillers: provide bulk
- Choice of extender can dramatically affect resistance properties
- Can contribute to "dry hiding" in >CPVC paints

Ingredients of Paint

Binder:

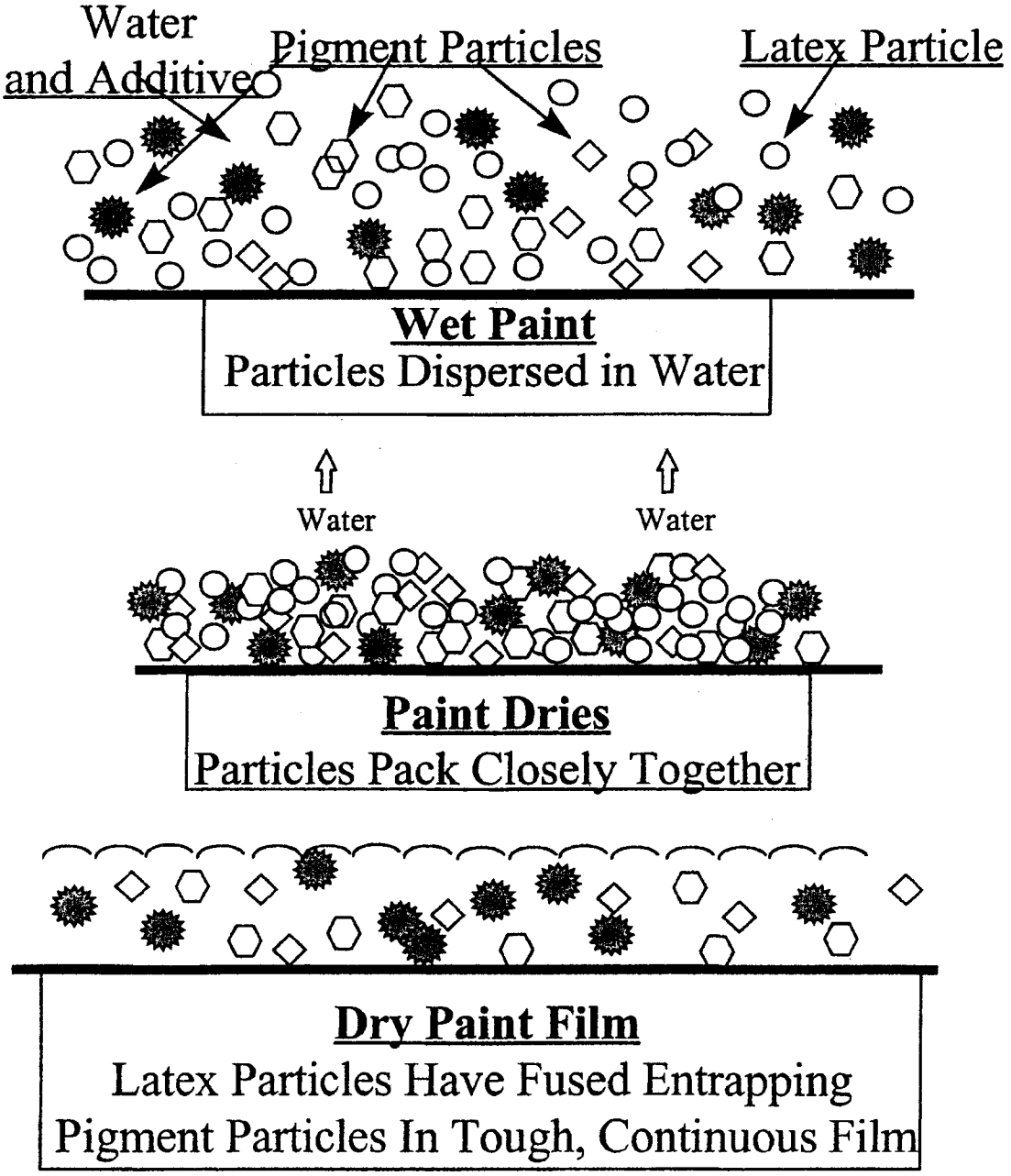
Provides Adhesion, Film Integrity, Durability

- **Oil-Based:**
  drying vegetable oils, modified oils (alkyds)
  (linseed oil, tung oil, soya oil alkyd, etc.)

- **Water-Based:**
  synthetic polymers dispersed in water ("latex")
  (acrylic, vinyl acrylic [PVA], styrene acrylic, etc.)

Ingredients of Paint

Latex Paint Film Formation



Ingredients of Paint

100% Acrylic Binders

--over 50 different products available--

these differ in balance of:

- adhesion
- block resistance
- water and blister resistance
- gloss development
- crack resistance
- dirt, mildew
- gloss, color retention

Ingredients of Paint

Vinyl Acrylic Binders

--many different products available--

these differ in balance of:

- block resistance
- scrub resistance
- adhesion
- hardness
- gloss development

Additives:

Misc. Ingredients That Impart Many Characteristics (mainly latex paints)

- Thickeners provide proper application consistency
- Biocides help protect against
  - growth of bacteria in the paint before use
  - growth of mildew on exterior paint
- Defoamers break bubbles from mixing, application
- Surfactants (soaps) provide stability, colorant compatibility, help "wet" surfaces

Ingredients of Paint

Co-solvents

- **Coalescent:**
  temporarily softens latex binder to aid low-temp FF
- **Glycols:**
  - **protect against F/T damage**
  - **aid with flow, brushing**
  - **are included in most colorants**
- **Are VOCs**

Ingredients of Paint

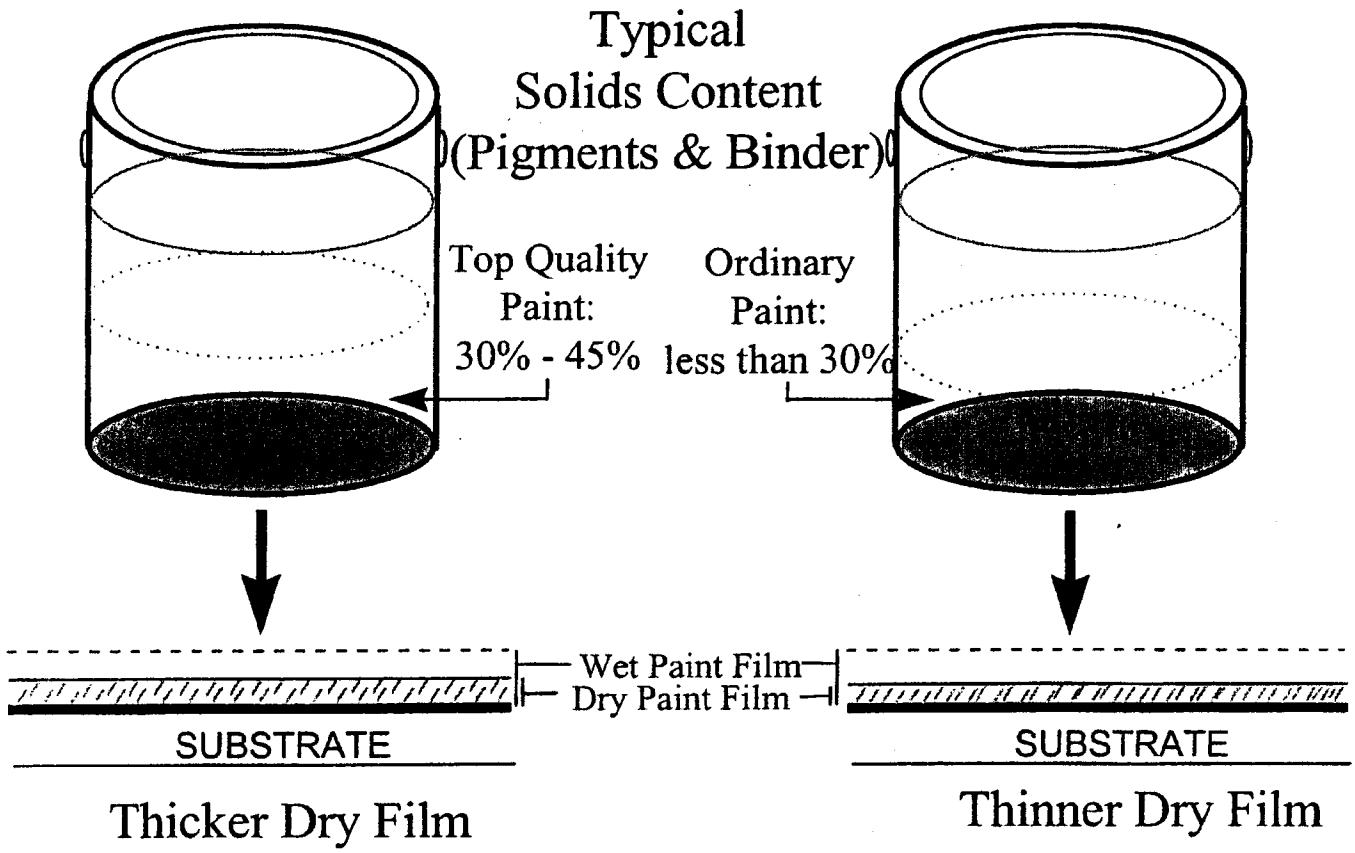
Liquids:

Provide proper consistency and application characteristics

- **Oil-Based, alkyd:**
  paint thinner (mineral spirits)
- **Lacquers:**
  lacquer thinner
- **Shellac: clears and primers:**
  denatured alcohol
- **Latex:**
  mainly water; co-solvents

Ingredients of Paint

The Higher Solids of a Quality Latex Paint Provides a Thicker Dry Film for Better Hiding and Durability



Ingredients of Paint

The Paint Formulator Can Vary The Proportion of Liquids to Solids

High V.S.

45%

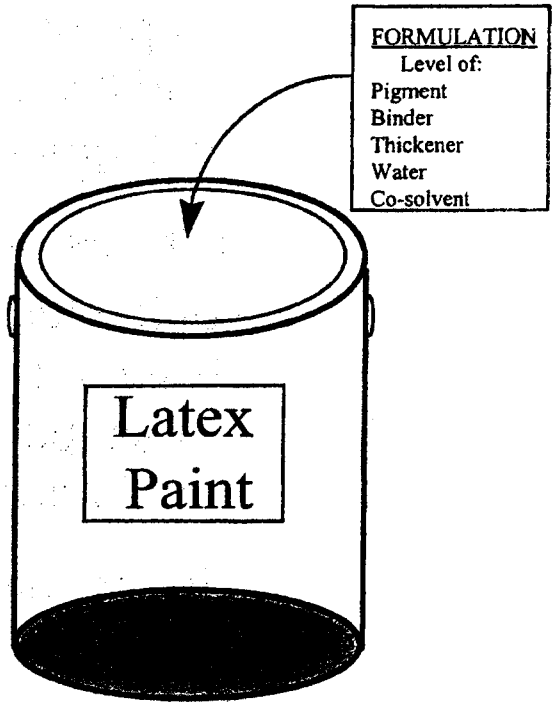
Thicker Dry Film Per Coat; Better Hiding & Durability

Thin Dry Film Per Coat; Less Hiding & Durability

20%

Low V.S.

Level of Solids Relative to Liquids: "Volume Solids"



Ingredients of Paint

Dimensions Defining Quality in a Latex Paint

No Single Dimension in Itself Assures Top Quality

1. Pigmentation (provides whiteness, color, hiding, bulk)
   - level of prime pigment (TiO_2, colors)
   - type and level of extender pigments
   - ratio of pigment to binder (with flat paints)
2. Binder (binds pigment; provides adhesion, film integrity)
   - type of binder (100% acrylic, vinyl acrylic, etc.)
   - suitability of the particular binder (hardness, particle size, etc.)
   - ratio of pigment to binder (mainly with flat paints)
3. Other Ingredients ("additives" used in making the paint)
   - mildewcide, thickener type, co-solvent
   - defoamer, preservative, surfactants
4. Solids Content: (proportion of pigment-and-binder to liquids that evaporate when the paint dries)
   - higher solids provide better hiding, durability
   - the solids themselves must be appropriate

Benefits of Solvent-Free Paints:

- Lower Odor Paints
- Decreased Oganic Solvent Emissions
- Reduced Exposure to Organic Solvents
- Commercially Acceptable Performance ?
- Good Cost Performance ?

Solvent-Free Latex Paints: the Balancing Act

Conventional Latex Paints: *Properties from Organic Solvents*		Solvent-Free Latex Paints: *Ingredients replacing Organic Solvents*
Film Formation	→	Binder/Extender Choice
Freeze-Thaw Stability	→	Binder/Additives
Pigment Wetting	→	Surfactants
Substrate Wetting	→	Surfactants
In-can Preservation	→	Effective Preservative Level
Open/Wet Edge Time	→	Rheology/V.S.

Formulating Solvent Free Paints

- High PVC (Flat)
  - –Balancing Freeze/thaw vs. Scrub Resistance
    - otherwise, perform equally well as compared to conventional coatings
- Low PVC (Semi-gloss)
  - –difficult to achieve the following properties simultaneously
    - LTFF
    - Hardness/Block Resistance
    - Scrub Resistance
    - Freeze Thaw Stability
    - Cracking/Flaking
    - Tint Retention
    - Dirt Pick-up Resistance
    - Effloresence/Alkali

ATTACHMENT D

AUGUST 21 AND DECEMBER 11, 2000 NPCA COMMENTS TO OTC

August 21, 2000 Comments to NE OTC AIM Workgroup

August 21, 2000

Rob Sliwinski
Section Chief
Stationary Source Planning
Division of Air Resources
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-3250

Dear Rob:

At our meeting on July 11, we agreed to provide information concerning our reservations about the Staff Report underlying the Suggested Control Measure for architectural and industrial maintenance (AIM) coatings adopted by the California Air Resources Board (CARB).

In undertaking this task, it must be recognized that this is not intended to be a comprehensive critique of the Staff Report. There is much in the document that reflects exercise of judgment in the face of an array of information and data which does not lend itself to scientifically certain answers nor refutations. The main thrust of the document is to make judgments about likely future coatings technology developments taking into account current information and development plans of the industry. It goes without saying that we do not agree with many of the conclusions reflected in the Staff Report about the likely outcomes of future technology developments or the commercial feasibility of anticipated developments. Our purpose here is to share with you our thoughts so as to better inform your judgment about the implications of the information in the Staff Report for adopting the same or similar limits for the northeastern United States.

The practicality of following the SCM in the Northeast: As an initial matter, the OTC should examine the requirements of the SCM to determine if it suits the northeastern United States. For example, the SCM contains a provision relating to the industrial maintenance coatings category which is crucial for the protection of the infrastructure in the Northeast. The SCM calls for a general VOC limit of 250 grams per liter for this category by 2004. However, for areas "located within the North Central Coast, San Francisco Bay Area, or North Coast Air Basins" a higher limit is specified. The reasons for this higher limit is the inclement weather conditions (high humidity, persistent fog, and cold temperatures) of these areas. (See Staff Report at page 150.) These are weather conditions

common to most of the northeastern and mid-Atlantic states. The practicality of drawing distinctions on the basis of weather in the areas making up the jurisdiction of the OTC would be very difficult, if not impossible. This provision of the SCM demonstrates that "weather matters" even in California.

A general comment concerning the methodology: It should be recognized that predicting future technology and commercial feasibility is not an exact science and obviously an agency attempting to do this should be given some latitude.

For example, at page 69 of the Report, the following is said about the feasibility of low-VOC technology for formulating flat coatings: "The high market shares that already comply with the proposed limit demonstrate widespread use of existing low-VOC technology for formulating flat coatings." Later at page 104 in answer to a comment that the complying market share of a high gloss coating amounted to only 2.6 percent, the Report states: "The marketshare of complying products is just one element we considered in our evaluation of the feasibility of the proposed VOC limit. We also evaluated product information from manufacturers, laboratory performance tests, and information on available resin technology." While the decision was made to grant a higher VOC limit in this case, it was done for enforceability reasons and not technological feasibility reasons.

The point is that the process involved here is not an exact science and there can be a variety of factors that have to be taken into account in making a decision.

Staff is given a certain latitude in picking which aspects of its factual record it chooses to emphasize for one conclusion and not for another.

But because of this, we believe that it would behoove your group in evaluating the limits offered by the SCM to independently examine the evidence that the Report relies on for selecting the SCM limits to determine independently whether you weigh the incomplete information the same way as CARB staff did and can arrive at the same conclusions based on it.

Limits still being evaluated for technological and commercial feasibility: As you know, the SCAQMD was the first to adopt in May 1999 the limits that were subsequently adopted by CARB in the SCM on July 22, 2000. In adopting the limits, the SCAQMD Board directed staff to continue to evaluate the future limits to determine their feasibility and report to the Board periodically and before the limits are to become effective to ensure that the are in fact feasible. The CARB Board gave the CARB staff a similar instruction when it adopted the SCM on July 22, 2000. I raise this point because the SCM itself makes no mention of this. At page 13 of the Report, it is stated that "staff believes all of the VOC limits proposed in the SCM are technologically and commercially feasible by the effective dates of the SCM." (Emphasis added.) But the Report then goes on to note that despite that the staff " believes that all of the proposed limits are

technologically and commercially feasible, ARB staff will conduct technology reviews of the proposed limits that are lower than current limits, prior to their implementation."

The Report also states:

> "Our survey results demonstrate that for nearly all the coating categories, products are currently available that comply with the proposed limits. For the 11 categories for which we are proposing lower limits than the predominant limits in existing district rules, the complying marketshares range from 13 to 74 percent..... The complying marketshares vary widely with each coating category because the proposed limits were developed after considering a variety of factors unique to each category. <u>These factors include the availability of reformulation options that may not be used in current products, the variety of product types in a given coating category, patents that may restrict some reformulation options, and economic issues.</u>"

Again this language in the Report suggests that there are good reasons for independent technological assessments, despite the staff's belief that the proposed limits are feasible.

In answer to the question "Will the reformulated products perform similar to existing products?", the Report states, "Yes."

The Report then justifies this as follows:

> ARB staff concludes that the overall performance of the reformulated products will be similar to the performance of their higher VOC counterparts. This conclusion is based on: (1) the current availability of complying products in the marketplace; (2) ARB staff's analyses of each product category, as detailed in Chapter VI; and (3) the results of performance studies conducted by independent laboratories (the "National Technical Systems (NTS) Study" and the "Harlan Associates Study"). The NTS study showed that when compared to conventional coatings, currently compliant, low-VOC coatings available today have similar application and performance characteristics, including blocking resistance, mar resistance, adhesion, abrasion resistance, and corrosion protection. The raw data from the Harlan Associates study was published in 1995. Although somewhat dated, the information generally supports the results of the NTS study.

As you will see in our attached April 7 submission to the staff concerning its draft version of the Report, we believe that there are serious questions concerning the confidence one can have in the conclusion's reached by the staff based on the information it relied upon.

To take but one example, as noted the staff reviewed the NTS study's results and concluded that "The NTS study showed that when compared to conventional coatings, currently compliant, low-VOC coatings available today have similar application and performance characteristics...."

An examination of the of information concerning the NTS results for "industrial maintenance primers" shows why OTC staff should look behind the assertions of the CARB Staff Report.

In Appendix E of the Staff Report, SCAQMD (Phase II Assessment Study), eleven performance characteristics are evaluated for Industrial Maintenance Primers. Of these eleven, four demonstrated that low VOC coatings exhibited lower performance characteristics compared to high VOC coatings.

Despite this, the assessment states, "Overall, low VOC coatings exhibited similar performance compared to high VOC coatings."

As an initial matter, it is difficult to justify a conclusion that one product is substantially similar to another when it fails to meet over thirty-six percent (36%) of the performance characteristics of the other product. More importantly, the characteristics for which the low VOC coating exhibited lower performance are crucially important in terms of the long term performance of the coating.

The four characteristics for which the low VOC coating showed lower performance were 1) "Dry Time -- Dry to Touch" ; 2) Dry Time --Dry to Hard; 3) Contrast Ratio --Hiding Power; 4) Taber Abrasion Resistance. All of these are important initial application performance characteristics.

- Dry To Touch -- If it takes a coating longer to dry to touch, it is subject premature failures from overnight dew or rain at any time.

- Dry to Hard -- Only when the primer is finally hard is it ready for the subsequent coating.

- Contrast Ratio- Hiding Power involves the issue of how much coating must be applied to cover and protect the surface. This result implies that more of the lower VOC coaitng will have to be applied to achieve the same coverage as the higher VOC coating.

- Abrasion resistance as it name implies has a lot to do with how long the coating will hold up to abrasion, contact from wind, hail, dirt, etc.,

A common sense understanding of these characteristics shows that they are among the most important initial application characteristics of a coating from the perspective of coating performance.

I suppose, following the way similar points were handled by the Staff Report, the Report would answer this with something along these lines, "We base our conclusions on a number of factors, the NTS Study is only one factor. For example, coatings manufacturers are currently working to solve these problems with the lower VOC products."

But a good question one might ask in weighing such information is: if you knew about the four areas of sub par performance, would you nonetheless purchase the lower VOC coating for your home or agency on the assurance that, despite these shortcomings, "overall" the coating is "similar to coatings" that do not have the shortcomings? Or would you enter a binding contract to purchase the coating in the future on the assurance that the manufacturer would have all of the lower performance problems solved by that time?

All of this suggests that you should look behind the conclusions of the Staff Report and information relied on to reach them.

Finally, you should note that the long term durability performance characteristics such as loss of gloss, color retention, chalking, blistering, etc., have not yet been evaluated under the NTS study and await future evaluations.

In concluding, Rob, we realize that time is of the essence for you.

We are prepared to meet with you and your staff to discuss in more detail our reservations about the Staff Report for the SCM. We also have submitted for your review some suggestions on where we believe that VOC limits might be lowered below the national limits.

Sincerely,

Jim Sell
Senior Counsel

Comments to CARB Draft EIR
Included as Attachment to August 21 Comments to NE OTC Work Group

Ms. Janette Brooks
Stationary Source Division
California Air Resources Board
2020 L Street
Sacramento, CA 95812

Subject: Comments on the Draft Program Environmental Impact Report (EIR) for Suggested Control Measure (SCM) for Architectural and Industrial Maintenance (AIM) Coatings

Dear Ms. Brooks:

On behalf of the National Paint and Coatings Association (NPCA), we are providing comments concerning the Draft Program Environmental Impact Report for Suggested Control Measure (SCM) for Architectural and Industrial Maintenance (AIM) Coatings (February 2000). A number of our member companies will also be submitting comments.

The NPCA is a voluntary, nonprofit trade association representing some 400 paint and coatings manufacturers, raw materials suppliers and distributors. As the preeminent organization representing the paint and coatings industry in the United States, NPCA's primary role is to serve as ally and advocate on legislative, regulatory and judicial issues at the federal, state and local levels.

We estimate that over 80% of the volume of AIM coatings sold in California and which are at issue under the SCM are manufactured by NPCA members.

I. GENERAL COMMENTS

NPCA has been extensively involved in development of VOC control regulations for AIM and other coatings in California since the inception of clean air programs in California, beginning in the 1960s. Our record in this regard has always been one of constructive cooperation. We recognize the obligations of the industry to contribute its fair share in coatings technology improvements to help with the clean air problems of California. The industry even without regulatory prodding has consistently lowered the VOC content of its coatings. We seek by our participation to impart to regulatory decisions our frank and best estimates of what is technologically feasible and the associated consequences and costs of selecting certain technologies.

Most recently we have been extensively involved in the development of the current draft SCM, including assisting CARB in obtaining responses to its various requests for information in connection with the development of the SCM. We encouraged our members to forthrightly respond to the CARB survey that is part of the factual basis for the SCM, and we encouraged members to meet with CARB staff in an effort to provide a better understanding of the complexity of the technology issues that are inherent in this regulatory effort to lower the VOC content of AIM coatings. NPCA staff and member companies have met with staff on a number of occasions in efforts to provide information that would provide a sound basis for developing an effective SCM for AIM coatings.

As a general comment we have to say that we are disappointed with the process utilized to adopt the SCM in this case and in the lack of adequate fact finding.

The importance of this undertaking cannot be over emphasized. The SCM will stand as a presumptively valid decision about what are cost effective, commercially viable, and technologically productive coatings for usage in the thirty plus air districts in California. At issue here are the millions of homes in those areas and important infrastructure, such as bridges and chemical storage facilities, related to the convenience and safety of the people in those areas. In making these critical comments, we hope you recognize that NPCA represents the full spectrum of AIM coatings manufacturers in the United States, including companies that specialize in the development and manufacture of low VOC coatings.

NPCA does not have (indeed could not have) a position that only high VOC coatings technology is presently or foreseeably available. Aside from being a demonstrably inaccurate statement, it would cause us to lose those members that manufacture and sell low VOC coatings. Rather the position of the NPCA is as follows:

> A low VOC product technology may be successfully used currently to meet the performance requirements of one particular application and exposure environment of a general class of coatings. However, there must first be a thorough evaluation of this technology before it can be mándated as being feasible for all or even most of the application, performance, and exposure requirements of the general class of coatings to which it belongs. For example, an expectation that currently available low VOC industrial maintenance coatings could effectively replace all other industrial maintenance coatings currently in the market place is completely at odds with the history of advances in coatings technology. Reliance on such an expectation to guide the Staff's inquiry would be dangerously misguided. There is no substitute for a thorough, open minded, and objective evaluation of existing and reasonably foreseeable

coatings technologies in setting future VOC limits. We do not believe that this has occurred here.

It is important to note here that some of the NPCA member companies that are most concerned about the proposed limits are companies that manufacture low VOC coatings and emphasize the sales of their low VOC coatings because of their profitability.

We note the EIR characterizes the SCM as follows: "To fulfill [its] statutory mandates, the ARB often provides guidance and other assistance to the districts, including the development of model rules, such as the Suggested Control Measure for Architectural Coatings." (Draft Program EIR at page I-2)

The SCM thus carries great weight with the individual air districts, which as staff has noted throughout this process are the agents that ultimately have to formally adopt the limits and requirements of the SCM as district rules before they can be effective. In this sense, however, the SCM my be better conceived of as a "suggestion" from a reviewing authority that ultimately has the authority to disapprove plans from the districts that do not achieve the progress thought achievable by CARB. As a practical matter, therefore, districts do not deviate greatly if at all from CARB SCMs, even in cases where they might have reservations about their conclusions.

The EIR under discussion here is an instrumental document in the SCM adoption process as well as in the adoption of individual district rules that are based upon it. As noted by staff in the Draft Program Environmental Impact Report for Suggested Control Measure (SCM) for Architectural and Industrial Maintenance (AIM) Coatings:

> "This Draft Program EIR has specifically and comprehensively addressed the environmental impacts associated with the Architectural Coatings SCM in accordance with CEQA, so that the districts, if they choose to do so, may rely on the analysis in the Program EIR when adopting or amending their architectural coatings rules." (Draft Program EIR at page I-3)

Consequently, it is important for the Program EIR to be as accurate as possible in that districts may rely upon it with out further consideration. It will in short become a presumptively valid document that will not lend itself readily to subsequent questioning or criticism by the district.

It is for these reasons that we remain deeply concerned about what we consider to be fundamentally flawed conclusions about the technological and economic feasibility of many of the VOC limits that are the basis of the analysis of the EIR. If the staff is in error about the technological feasibility of the limits that it has

specified in the SCM, then the environmental impacts assessed in the EIR are equally flawed.

II. DUE PROCESS/INTERSTATE COMMERCE ISSUES -FEDERAL AND STATE

Serious federal constitutional due process and interstate commerce issues can arise in the development of an SCM if it is not handled properly. As noted, the SCM is intended to serve as a consensus template for the districts to adopt without having to expend the time and resources that otherwise would be required of them. There is nothing inherently wrong with this approach and if implemented as intended, it can result in a more efficient development of reasonable regulatory requirements, saving both the regulators and the regulated community time and money. Problems can arise, however, if insufficient time and effort is afforded to ensure a full airing of issues. The potential for a classic "Catch-22" inheres in the process. The SCM is only guidance, so therefore it need not comport with the requirements of a rulemaking. The formal protections of rulemaking are intended by the process to be afforded when the districts consider adopting the SCM. But because the SCM supposedly reflects already vetted technology, districts are encouraged to rely upon the fact findings of the SCM for their fact findings. If in fact the SCM technology is not truly consensus technology, then the public never really has a realistic opportunity to a full airing of its concerns-- the SCM is conducted without the requirements of administrative legally sufficient fact findings and the districts in turn are not required to reconsider the findings except as their discretion dictates. This raises concerns about the potential for denial of due process under the federal and California constitutions as well as the potential for unconstitutional interference with interstate commerce as the resulting regulation may impose disproportionate burdens on out of state manufacturers.

III. INFORMATION RELIED UPON BY THE EIR

The staff has relied upon the following for its conclusions in the EIR:

- Results of laboratory tests from the NTS study and other results from the 1995 Harlan Study
- What the EIR characterizes as an "extensive" review of compliant coatings product data sheets.
- Results from the CARB 1998 AIM survey that the EIR characterizes as indicating that a large percentage of coatings already meet the proposed limits.

- Information on "foreseeable coatings technologies " obtained from resin suppliers and coatings manufacturers data sheets and (promotional) magazine articles

We discuss each of these and their inherent limitations below.

A. The EIR's Treatment of Test Data

The EIR's treatment of available test data manifests fundamental misconceptions about the effective use of such information by the industry.

Coatings manufacturers extensively test new coatings before introducing them to the market. These test include two and three year field exposure tests because it is only under such real world conditions that new coatings' performance characteristics can be assured.

As mentioned in the EIR document, a number of the low VOC coatings that would be mandated by the SCM are the subject of a study being conducted by the SCAQMD pursuant to revisions to its AIM rule in May 1999. The EIR states,

> "In addition to the laboratory results, accelerated actual exposure, real time actual exposure, and actual application characteristics studies <u>are continuing. The results of the study are an important part of our technical evaluation of these six coating categories</u> (see Appendix D, Description and Technical Assessment of the Coating Categories). The purpose of the NTS study was to test the application and durability performance of very low-VOC, low-VOC, and just-compliant coatings for the following six coating categories:
> · Industrial Maintenance Coatings
> · Nonflat Coatings
> · Primers, Sealers, and Undercoaters
> · Quick-Dry Enamels
> · Quick-Dry Primers, Sealers, and Undercoaters
> · Waterproofing Sealers"
> (Emphasis added) (Draft Program EIR at page II-24)

While the EIR states that the results of the study are an important part of the staff's technical evaluation for the six coatings categories, it must be noted that what the industry consider to be the most important tests - real time actual exposure, and actual application characteristics studies - have not been completed. Consequently, it will be necessary for the districts to evaluate the technology of the limits for these coatings before accepting them as technologically feasible. In this regard, we also note that in Appendix D of the EIR, there is language suggesting that these tests are not really necessary to warrant the conclusions reached in the EIR about the technological feasibility of

the coatings at issue. As indicated, therefore, the SCM will be issued without the benefit of the most crucial results of the most important of these tests. Apparently, the staff believes that in some respects the laboratory results of the NTS study are sufficient to justify its conclusions:

> "The ARB staff has analyzed the impact of allegedly ineffective low-VOC coatings. There is a wide range of commercially available coatings that meet the proposed VOC content limits in the SCM. ..... Additionally, the results of the SCAQMD's NTS study support these findings. The laboratory results of the SCAQMD's NTS study reveal that there are currently available coatings that comply with the proposed VOC content limits and with coating and durability characteristics comparable to existing high-VOC coatings." (Emphasis added) (Draft Program EIR at page C-21)

We disagree with this and believe that any decisions about the technological and economic feasibility of the limits proposed in the SCM for the six categories under consideration must await the final results of the study which will include real time actual exposure, and actual application characteristics studies.

In rejecting our request to formally commit to a technical assessment of the SCM limits prior to their becoming effective, the staff stated the following which suggests that it too believes that the final word is not in on its conclusion that the SCM proposes technologically and economically feasible coatings limits.

> "Even though the ARB staff believes that compliant coatings are available to meet the SCM limits, we are committed to working with the SCAQMD, other interested districts, and the architectural coatings industry as they conduct technology assessments of the future VOC limits..... Since the ARB staff will be conducting the assessments, we do not believe that it is necessary to include a technology assessment provision in the SCM ..... After each technology assessment the ARB staff will Report the results to the staff of each district, and district staff can then Report to their District Governing Boards as to the appropriateness of maintaining the applicable future VOC limits." (Draft Program EIR at pages C- 7-8)

These statements taken as a whole indicate that the conclusions of the staff about the feasibility of the limits and coatings the SCM proposes are suspect and will require further analysis.

Additionally, it is our position that the NTS study laboratory results that are available are suspect in their own right as has been explained to staff in a letter from Christine Stanley, Vice President of Technology, of Ameron Coatings. See also NPCA's letter to Jim Nyarady on this subject.

With respect to the Harlan Study there are several issues.

It is an incomplete Report, providing only raw data. The Abstract of the study states:

> " Data were complied for each product evaluated and is presented in this Report. No comparison of the properties or performance of the samples was required by this contract." (Emphasis added) (Harlan Study at page 4)

The evaluation of the raw data was left to the ARB staff and not to the contractor who was the coatings expert.

The Report consists of a series of summary tables and test Reports for individual coatings. Information on individual coatings (such as recommended use and application of each of the coatings tested) is NOT included in the Report. This makes it very difficult to evaluate and compare the data in the summary sheets .

The Report was not peer reviewed. Without some industry involvement or review of the testing and Reporting of the data, the conclusions based on the Report are suspect.

Blind samples were used making any verification or comparison to other test results impossible. On the other hand when other testing groups, like Consumer Reports Magazine, do coatings testing, the products and manufacturers are identified so that any inconsistent or erroneous results can be spotted and challenged.

Different contractors were involved. Many of the tests performed in the study are very subjective types of tests, in which the results can vary markedly from technician to technician, e.g., pencil hardness, block resistance, application properties adhesion.

There is no indications of what if any QA/QC procedures were used. Nothing is mentioned about the qualification of the laboratories or their personnel and their QA/QC procedures.

The Appropriate Way to Make Coatings Technology Comparisons

With respect to making comparisons of low VOC coatings with higher VOC coatings Table IV-2 in Chapter IV of the EIR does so on the basis of the following characteristics of a coating

- Range of VOC
- Average VOC Content
- Average Solids by Volume
- Average Coverage

- Average Dry Time
- Average Pot Life
- Average Shelf Life

All of the above are interesting but relatively insignificant properties of a coating. They do not really tell one anything about the performance and durability characteristics of the coating or its suitability for a particular job .

A true comparison of coatings characteristics must take into consideration the following factors:

- Performance - how does the coating perform – What type of exposure was coating formulated to withstand, e.g., acid- base; waste water, high temperature? What are its real performance characteristics? Performance is more than cure time and shelf life. It includes durability under real life/field conditions.

- Application latitude – What type of equipment is need for application? Is highly sophisticated spray equipment required? Are there any limits on the application temperature or atmospheric (humidity) conditions under which it can be applied? What film thickness does it have to be applied at in order to meet the required performance characteristics?

- Surface latitude – What type of surface can the coating be applied to and what type of surface preparation MUST be done to insure a proper job? Surface preparation is crucial if an acceptable job is to be completed.

- Cost effectiveness -- An important and crucial factor that could tip the decision on whether a coating job is undertaken. Cost effectiveness includes the review of the service life of the coating, its application costs and required surface preparation, as well as the cost of the coating itself.

- Waste considerations: Will the use of a particular coating generate a high amount of waste product and will any special surface preparation cause the generation of additional solid or hazardous waste, e.g., old heavy metal containing coating that MUST be totally removed before the application of the new highly sophisticated coating 2K product.

These are the essential issues that have to be addressed when evaluating whether one coating can be substituted for another. For industrial maintenance coatings and other high performance coatings this is a very complex task.

It is obvious from a reading of the EIR that CARB did not consider these five very important factors in its review of product data sheets. These are the key factors that any knowledgeable coatings formulator, specifier or applicator would

consider crucial in deciding whether a particular coating is suitable for a particular application.

It is our position that before any district could reasonably adopt the limits of the proposed SCM, it should undertake an evaluation of these factors with respect to the coatings at issue.

B. Review of Compliant Coatings Product Data Sheets

It appears that too much reliance has been placed upon product data sheets for the staff's conclusions. This is particularly troublesome in light of the fact that product data sheets often require review by a coatings expert in order to be fully comprehended. An example of the basis for our concerns is seen in the following statement from the EIR:

> "ARB staff evaluated hundreds of conventional and low – VOC coatings product data sheets. The product data sheets indicated that low-VOC coatings do not require substantially different surface preparation, including power washing, than conventional coatings." (Draft Prgram EIR at page C-15)

This statement is completely at variance with what is commonly known within the industry and in fact is implemented in training and education by such organizations as Paint and Decorating Contractors of America and the Society of Protective Coatings, i.e., more attention to proper surface preparation is required of the newer two pack high performance coatings than conventional coatings. It is also true that instructions for conventional coatings require adequate surface preparation. But the staff's equating the degree of surface preparation required by two types of instructions that are associated with radically different coatings gives us concern that it does not fully comprehend the greatly differing consequences associated with using these two different coatings systems.

Staff's reliance on the product data sheets also apparently convinced it that there are no pot life problems associated with multi-component systems:

> " Regarding pot life, the ARB staff's review of currently available, multi-component low-VOC coatings revealed that pot-life problems are not anticipated." (Draft Program EIR at page C-18)

This too is completely at variance with the real world experience of the industry, notwithstanding individual product data sheets that may minimize the problems or state that they are not substantial if "instructions for use" are closely followed. As explained in comments being submitted by Ameron Coatings concerning the EIR, the pot life issue is an extremely significant and complex issue affecting the cost of application.

C. Results from the CARB 1998 AIM Survey

With respect to the results from the CARB survey, we again caution that

low VOC product technology may be successfully used currently to meet the performance requirements of one particular application and exposure environment of a general class of coatings. However, there must first be a thorough evaluation of this technology before it can be mandated as being feasible for all or even most of the application, performance, and exposure requirements of the general class of coatings to which it belongs.

D. Information on "Foreseeable Coatings Technologies" from Promotional Materials of Resin and Coatings Manufacturers

Caution should be exercised in relying on information from resins and coatings manufacturers and their promotional materials that are published in trade journals that are not peer reviewed. Statements about the properties of a resin starting formula are just that -- where the coatings formulator begins to determine whether an adequate cost effective coating may be developed based on it.

E. Appendix E Tables

As numerous industry commenters have pointed out, many of the coatings products listed in the tables in Appendix E do not belong in the coatings category in which they are listed. For example: over 30 percent of the products listed as lacquers are in reality polyurethane varnishes.

IV. DISCUSSION OF SPECIFIC COATINGS CATEGORIES

A. Floor Coatings

Originally as this category was developed under the national AIM rule it was defined as:

> "an opaque coating with a high degree of abrasion resistance that is formulated and recommended for application to flooring including, but not limited to, decks, porches, and steps, in a residential setting"

During the discussions surrounding the development of the revisions of SCAQMD's Rule 1113, the reference to residential setting was dropped in order to expand the use of the coatings to commercial and institutional settings.

CARB now would expand the definition to cover floors exposed to extreme environmental conditions which historically have been covered by industrial maintenance coating category. In so doing, it would prevent the use of higher VOC industrial maintenance coatings on floors in settings that require such

coatings. This would mean that the conditions would allow for use of the industrial maintenance coatings on walls, but only lower VOC materials could be used on the floors exposed to the same conditions.

The data sheets that CARB is relying on to make their decision concerning the VOC limitation cover a wide variety of product types and hodge-podge of coatings technologies. These products range from simple latex porch and deck enamels used by home owners (which have very limited applications and uses) to "exotic" 2-K materials that require complex mixing and application equipment and special surface preparations (only available to trained professional applicators) or which pose safety concerns. These materials often are accompanied by such warnings as,

> " For industrial use only by professional applicators"; or " An eye wash and safety shower should be nearby and ready for use."

Others are elastomeric floor coatings that require film build of over 22- 24 mils in order to be effective. And others have severe use limitations, e.g., they are not recommended as exterior topcoats or are not be applied to horizontal surfaces that become slippery when wet.

Additionally, a number of the products cited by the EIR for the low VOC floor coatings only represent raw material suppliers best "suggested starting formulas" and are not commercially viable products.

Also, several of the coatings listed as floor coatings do not belong in the "floor coating" category, e.g., " semi clear concrete sealers and safety and zone marking paint."

It should be obvious from the wide variety of products currently being sold as floor coatings, that no single product or technology is able to satisfy all of the varying application conditions and performance requirements covered by this category. The ARB's decision to totally rely on high end 2-K or polyurethane technology that is normally marketed for industrial application only by professional painters is flawed and does not reflect the true market place needs for floor coatings in all situations such as residential, institutional and commercial.

We recommend that the definition for "*floor coating*" be revised to read:

> "*Floor Coating: An opaque coating formulated and recommended for application to flooring including, but not limited to, decks, porches, and steps, for the purposes of abrasion resistance.*"

Also the definition for "*Industrial Maintenance Coatings*" should be revised to remove the phase "*excluding floor coatings but*".

B. Non Flat Coatings; Primers, Sealers and Undercoaters; Stains; Industrial Maintenance Coatings; and Lacquers

Through out this process, NPCA has attempted to bring in the coatings experts from its membership to discuss the technological and economic feasibility issues that are involved with the proposed SCM limits. We are particularly concerned about the coatings identified above and we urge CARB to consider the comments and information that have been provided by our members and other coatings experts. In doing this we believe that CARB should rely on the consensus judgement of the experts.

C. Categories Not Proposed for Inclusion in SCM

There are sixteen categories of coatings that are recognized by the national AIM coatings rule which are rejected for inclusion in the SCM. Among the reasons cited for this decision in the EIR are the following:

> "With the exception of antigraffiti coatings, these categories are not generally included in any of California's district architectural coatings regulations. The products under these categories are currently either: (1) subject to other coating categories in district regulations; (2) sold only under the small container exemption; or (3) not sold in California (at least in areas with architectural coatings rules). Nevertheless, we researched each of these categories because they were included in the U.S. EPA's architectural coatings regulation, and because in many cases these products will be subject to lower VOC limits under the proposed SCM compared to current district regulations. In researching these categories we considered a variety of factors, including: (1) the VOC limit they would be subject to under the proposed SCM; (2) the potential for reformulation as demonstrated by similar products already complying with the VOC limits in the proposed SCM; (3) the availability of products that do not fall under the category as defined in the national rule, but fulfill the same basic function at a lower VOC content; and (4) the extent to which products under the category are used in California. As explained in the following sections, we do not believe it is necessary to incorporate a new category and VOC limit for any of these categories." (Draft Program EIR, Appendix D, at page 178)

We understand that staff is reconsidering its initial decision to exclude the concrete protective coatings and now plans to incorporate the "concrete protective coatings" category recognized by the national AIM coatings rule at a VOC limit of 400 grams per liter in the SCM. In doing so, the staff appears primarily to rely upon on the information provided by Textured Coatings of America, an NPCA member. NPCA fully endorses the position of Textured Coatings and the inclusion of this category.

Another coating at issue here is the thermoplastic rubber coatings and mastics coating. (Draft Program EIR, Appendix D, at page 205) Inland Coatings, an NPCA member provided information to staff requesting this coating as defined by the national AIM coatings rule at a limit of 550 grams per liter of coating. It has provided information to justify its inclusion, and is prepared to provide more to staff in this connection. Discussions with staff about the exchange of information between Inland Coatings and staff indicate that there may have been some miscommunication. Staff stated that the company failed to provide sufficient information that demonstrated that its thermoplastic rubber products are more durable, and result in less emissions over time than comparable bituminous roof products or latex roof products. "We have no data to substantiate that thermoplastic rubber roofing products outlast their bituminous counterparts. We also note that latex roofing products are available." Staff also rejected the company's claim that its thermoplastic rubber products work in situations where water-based or bituminous products fail, e.g., they adhere well to single-ply membranes and adhere well when exposed to ponding water. "We have no data to substantiate these performance claims." The EIR concludes this discussion by stating, "...since thermoplastic rubber products are not used in California, we assume that other roofing products can be used to address these situations."

It is our understanding that the company has attempted to respond to these points and is prepared to provide more information on this matter. For example, with respect to the issue of durability, it is generally accepted information within the industry that coatings like Inland's dramatically outlast bituminous coatings. The nature of bituminous coatings is that they are of limited durability, and must be repaired and refurbished on a fairly regular basis. Inland Coatings can demonstrate single application, no repair histories for its coatings extending over several years. If this information was not provided in a manner that staff found sufficient, the company is prepared to provide more information. The same is true of its claims about single-ply membranes, with one of the major manufacturers of singly ply membrane coatings recommending Inland Coatings for repair of its product. Finally concerning the fact that the company's product is not used in California, this has occurred only because the company has refused requests from distributors to carry its product for unregulated areas in California simply from concern that through no fault of its own, the materials might wind up in a regulated area where they would be noncompliant. It is ironic that Inland's conscientiousness about California's clean air requirements now work against it for a reason that is wholly unrelated to issues of technological efficacy and more efficient methods for reducing over all VOC emissions from coatings.

Another coating that falls into this category is nuclear coatings about which Ameron Coatings, an NPCA member, has provided comments. The point being raised by the company is that the proposal would require the use of coatings that would be astronomically more expensive than existing systems and this added expense is grossly disproportionate to the minuscule amounts of VOC emissions

that result from the small usage of the existing coatings systems. We urge you to consider the company's comments.

NPCA also believes that the staff should reconsider its decision to exclude the other categories. In particular, we do not believe that the staff has had an opportunity to receive or fully review all of the information that would be necessary in order to make a sound decision on these coatings. It must be recognized that the process to date has necessarily focused on the larger coatings categories and the manufacturers of the coatings at issue here, many of which are niche market coatings, are often small businesses that need more time to respond. We request that this be given some consideration and that staff keep the door open for additional information about these coatings.

In reviewing data and technology for this area we suggest that the following general principles be considered. It should be recognized that coatings are developed for certain purposes. In this highly competitive industry, if a lower VOC product can cost effectively serve the same coatings requirements of a higher VOC product, it is selected over the higher VOC product. The U.S. Environmental Protection Agency in developing the national AIM coatings rule recognized this and the fact that many of these coatings were low volume niche coatings that previously fell under the general category of industrial maintenance coatings. They had to be specifically identified and broken out as coatings in their own right when the industrial maintenance coating category was lowered to VOC levels that were below the levels needed for these coatings.

The EIR is very cursory in its discussion for excluding these coatings, often stating little more than assumptions that are based upon the general coatings category of industrial maintenance coatings. Data concerning these coatings may not have been Reported under the category. For example, with respect to chalkboard resurfacing coatings, the EIR reflects that only a very small portion of the coatings Reported in the CARB AIM survey were identified as chalkboard resurfacing coatings. It is likely that some of the volume used in California was Reported as general industrial maintenance coatings.

Consequently, CARB should consider the possibility that information developed later in the rulemaking will demonstrate that indeed a higher VOC limit is required for these coatings. Like comments apply to the other excluded coatings categories. In any event, NPCA plans to continue to track this area during this rulemaking and to provide additional information on these excluded coatings as it becomes available to the NPCA .

V. REGULATORY ALTERNATIVES

A. Averaging

We are concerned that ARB has not chosen to include an Averaging Compliance Option in the proposed SCM or at least retain the placeholder Statement on Averaging that appeared in the December 1, 1999 draft of the SCM. Last December, the ARB formed a joint committee with SCAQMD to develop a workable averaging program. While we agree there are clearly differences between industry, SCAQMD and ARB on how to design a workable averaging program, ARB has chosen not to move forward with trying to resolve these difficulties. Instead the ARB has placed a lower priority on developing this program by indicating "... but the existence or absence of averaging does not affect either the ARB's analysis of the technical feasibility of the VOC limits in the SCM, or the ARB's environmental analysis for the SCM." (Draft Program EIR at page V-159)

We disagree with this position. In fact, averaging will be required to make some of the requirements feasible.

The ARB's proposed SCM is nearly identical to the SCAQMD's revised Rule 1113, a rule which was developed for the only district in the country ranked as severe ozone non-attainment area. Without an averaging provision, ARB's proposed SCM is more restrictive than the SCAQMD's revised Rule 1113.

B. Extended Compliance Deadlines

In of Chapter V. Project Alternatives, the ARB discusses four regulatory alternatives. Alternative B would extend all of the effective dates for the VOC content limits to January 1, 2004 with the VOC content limits for the affected coatings being identical to those in the February 11, 2000 draft. The ARB staff has rejected this alternative saying that any delay in achieving these emission reductions is not technically or economically justified. We disagree with this conclusion and urge the ARB to review their decision in light of industry's comments on the technical merits of the ARB's SCM development.

VI. MODEL FORMULAS TO ESTIMATE POTENTIAL MATERIALS COSTS

There are fundamental problems with the use of model formulas to estimate potential material costs.

The approach carries the inherent assumption that only one coating technology (resin technology) will be used to meet the lower VOC limits. Said another way, the approach implies that one technology will meet all the requirements of a category. This is unlikely and therefore the approach will not accurately estimate associated reformulation costs.

The model formulas are simplistic. Generally one cannot simply substitute a low VOC resin for a high VOC resin without changing other important components of the coating.

To obtain anything close to approximating a realistic estimate using this approach world require the use of real world formulas.

A more straightforward and more accurate way of estimating and comparing raw material costs of high and VOC coatings would be to compare only the cost of the high VOC resin to the low VOC resin on a WEIGHT OR VOLUME SOLIDS basis. By doing this one would at least get an idea of the magnitude of the cost difference, e.g., 1.5 time or 2 times more costly.

To obtain a better cost comparison beyond this, one would have to have to actual formulas for the current high VOC product and the low VOC replacement.

Also it is important to note that raw material cost are only one factor in calculating the total cost of reformulating coatings. Additional costs include packaging costs, direct R&D labor, etc.

VII. CONCLUSION

We appreciate the opportunity to provide comments on the EIR. We will continue to work with staff in the development of the SCM with a view to providing it with our best judgments about the technological and economic feasibility of the coatings technology decisions it is contemplating. But ultimately, the issue of whether Californians will continue to have access to cost effective, productive coatings rests with CARB and the districts. Our goal is to ensure that we have provided the decision makers with our best technical information and judgement.

Sincerely,

Jim Sell
Senior Counsel

Robert J. Nelson
Director Environmental Affairs

December 11, 2000

Rob Sliwinski
Section Chief
Stationary Source Planning
Division of Air Resources
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-3250

Dear Rob:

At the November 8 meeting of the AIM Rule Workgroup, I stated that the NPCA was still developing an alternative table of VOC limits standards that would include limits that are lower than those specified by the national AIM rule in several of the major coatings categories.

I passed out an article that had recently appeared in Modern Paint and Coatings written by a product manager from Rohm & Haas -- an international supplier of paint raw materials and a company that has taken an aggressive path in the development of waterborne technology.

In the article the manager provided a frank assessment of the performance trade-offs that occur with low VOC waterborne technology as compared to higher VOC technology. I won't repeat all that was said in the article here (it is attached). I used it as a reference point to help you and your work group understand why there have been difficulties in developing a consensus concerning lower VOC coatings within our industry.

I think a fair overall evaluation of the practical future for lower VOC AIM coatings is that, except for special applications in heavy duty industrial maintenance, the lion share of the lower VOC coatings gains will have to come from some type of waterborne coatings technology.

Moving to waterborne technology in this manner, which is essentially what the SCM does except for special case industrial maintenance coatings, rust preventative coatings, and certain specialty primers, carries with it the potential acceptance of a very large number of trade-offs of the type discussed in the Rohm and Haas article.

I say potential because the considered limits would not be effective immediately. Consequently, the on-going R&D efforts of the industry, the same efforts which began after World War II, long before there was a Clean Air Act and have moved residential AIM coatings to being 80% waterborne, will continue. These efforts may make some of the trade-offs --- using a term from the article -- "diminish." As I mentioned at the November 8 meeting, the author of the article only predicts

that the tradeoffs "will diminish" over time -- he does not say they will disappear. This is an extremely important point. What it implies of course is that all of the positive features that are associated with solvent borne coatings will not be equaled by the water borne coatings. These include higher solids cross linking that leaves a hard impermeable coat; less sensitivity to temperature and humidity conditions in application and curing; freeze/thaw stability which allows the coating to experience freezing weather without altering the coatings properties; good scrub resistance, etc.,

It is in the face of this kind of uncertainty concerning a great number of variables that our experts have been asked to develop a table that would predict where technologically feasible limits will be in the future.

We have developed such a table which is attached. You will note that it differs from the SCM in two key respects.

First, it recognizes a larger number of small volume, niche market or specialty coatings categories than are recognized by the SCM.

Second, it specifies VOC limits that are higher than the SCM in some cases but lower than the national rule. They strike a middle ground in other words.

The limits of the SCM as presented in the STAPPA/ALAPCO proposal, carry with them running commentary which refers to the CARB SCM Staff Report, survey data, and certain studies relied upon by CARB to justify the recommended limits. As we have said before we have serious reservations concerning the conclusions reached by the CARB about this information.

I hasten to add that we do not believe that the CARB staff has acted in bad faith in this regard. We simply respectfully disagree with their conclusions. In our comments to CARB in June, we acknowledged "...the effort that Staff has expended in this undertaking. They have gathered and attempted to analyze a great deal of information in a short period of time concerning a very complex subject." Similarly in my August 21 letter to you I stated, "...the process involved here is not an exact science and there can be a variety of factors that have to be taken into account in making a decision [and] Staff is given a certain latitude in picking which aspects of its factual record it chooses to emphasize for one conclusion and not another."

With this in mind, we had the sense from conversations with you and members of your work group that as between spending time on efforts refuting the SCM and STAPPA/ALAPCO document or providing information on what we believe are technologically feasible numbers, you would prefer that we tell you what industry believes is feasible and why. Consequently, the lion's share of our work since our meeting with you in September had been devoted to developing the consensus table of standards.

In the Overview of the model rule that is to be presented on December 11, there is a statement that indicates that you also will require technical documentation challenging the SCM and the CARB Staff Report supporting it.

We believe that an independent evaluation of the underlying data referred to by the CARB SCM Staff Report is required before the SCM is adopted for the states in the northeast Ozone Transport Region.

In our August 21, 2000 correspondence we pointed out that the SCAQMD Board which initially adopted the limits at issue here required staff to continue to examine the limits in question to determine if they would indeed be feasible before they became effective. We also noted that the CARB SCM Staff Report stated that despite that the staff " believes that all of the proposed limits are technologically and commercially feasible, ARB staff will conduct technology reviews of the proposed limits that are lower than current limits, prior to their implementation."

The limits therefore are open to question.

In this regard it is important to note that Pennsylvania's Regulatory Review Act requires a fairly extensive review and oversight of each regulatory development process to among other things ensure that the most cost effective regulations are developed that do not impose hidden costs on the economy of Pennsylvania. The objective of the process is to ensure that to the greatest extent a consensus is achieved among the parties and the agency. The independent oversight commission is tasked with "conducting independent research" of the issues raised.

Similarly New Jersey by statute and executive order requires an independent justification and legislative oversight for all environmental regulations that go beyond federal requirements, which the SCM proposal will do.

Beyond such specific additional independent review requirements, all the states within the OTC have administrative procedures that they must follow and these require the establishment of a sufficient factual basis to warrant promulgation of a regulation. The STAPPA document or the CARB SCM Staff Report by themselves do not provide this. More importantly, we believe that an examination of the underlying record will show that the judgments made by the CARB SCM Staff Report concerning future technology can be fairly questioned and should be by any agency that is concerned about what is likely to occur as a realistic assessment of future technology and its practical implementation.

Much reference is made to the NTS Study and the Harlan Study by the STAPPA document. We do not see how a technology can be referred to as established by

the NTS study , as the STAPPA document indicates, when the most crucial phases of the study, field applications and exposures have yet to be completed.

Moreover we have serious reservations about some of the CARB Staff's conclusions based on the laboratory results of the NTS study.

The NTS study results as recorded the CARB SCM Staff Report itself clearly demonstrated that high VOC coatings performed better than low and zero VOC materials in a number of tests. As I stated in my August 21 letter to you on this comparison, the tests in which the low VOC coatings under performed the high VOC coatings involve performance characteristics that are not trivial.

Despite this, the low or zero VOC coatings were virtually always found to be overall "similar" to the high VOC coatings.

In a strict sense, the statement of overall "similarity" is not incorrect. In all of these tests where the statement is made, there were more tests for which the results were found to be "similar" than dissimilar. But in our view this begs the key question -- are the similarities sufficient in key tests to justify a conclusion that the low VOC coatings will be adequate in all respects to replace existing higher VOC coatings.

In our judgment we do not believe they are.

For example, with respect to industrial maintenance primers, in four out of the twelve tests, high VOC coatings were found to exhibit better performance than low VOC coatings. In only one test did the low VOC coatings exhibit better performance than the high VOC coatings. And in the twelfth test, for film flexibility, a pass/fail test, of the four coatings that failed, three were clearly low VOC coatings, and one was at 320 grams per liter, which is below our recommended limit of 340 for this category. The Staff Report's conclusion was "Overall, the low VOC coatings exhibited similar performance characteristics compared to high VOC coatings." A technically accurate statement, but one which fails to answer the key question: the degree to which VOC limits can be lowered in the future such that none of the necessary performance properties of coatings are diminished.

We now turn to a discussion of our suggested limits and why we believe that they represent a sound practical evaluation of future technology that will achieve significant VOC emission reductions, precisely because they are realistic.

We will provide more details in further discussions with the OTC workgroup but for now a few major points.

The limits that are reflected in our Table of Standards include water borne technology limits, but ones that will allow for the achievement or approximation

of some of the performance characteristics of solvent borne systems. For example a flat coating at our recommended VOC limit permits the manufacture of coatings that can be used in low temperature conditions. Madelyn Harding of Sherwin Williams provided information to your group on such a coating that is sold by her company. This allows for more painting in the spring and fall when there is no ozone formation.

Our limits include solvent borne technology when they are needed by the application and performance requirements. In this connection we again ask that you critically examine the findings of the CARB SCM Staff Report concerning the NTS results for the non-flat and quick dry coating categories, especially with respect to the scrub resistance and blocking resistance.

As we have explained in the past, among the most crucial reasons for having a nonflat coating are the blocking resistance and scrub resistance features. Blocking resistance keeps doors and windows from sticking shut; scrub resistance allows a wall, such as a kitchen wall, to be cleaned without removing the paint. It is also important to note that with respect to the NTS study tests of nonflat and quick dry systems that were tested for dry film thickness, adhesion, and household chemical resistance (the type of splatters that occur in kitchens, playrooms, etc.,) the CARB SCM Staff Report concluded that the low VOC materials under performed the high VOC coatings in all the tests, except for only one aspect of the chemical resistance test -swelling.

As to stains and water repellant materials, the basic chemistry of this is quite simple. For stains, in order to get the penetration into the wood needed for the deep, rich look for which transparent and semitransparent stains are used, one needs a solvent carrier. Water simply cannot take the stains deep enough into the grain to achieve the same appearance.

As to water repellants, the same basic principle applies -- solvent carries the solids deeper into the wood than does water. In fact many of the low VOC water repellant materials are in actually coatings that sit on the surface of the wood, and thus are worn away over time. A deeply penetrating material lasts much longer and thus reduces overall VOC emissions.

We also strongly believe that there is a need for the specialty coatings that we have identified in our list of standards. Though these are low volume coatings they meet important needs. As a matter of principle we are committed to ensuring that they receive consideration equal to that given to the major coatings categories.

These are very low volume and highly specialized coatings. Your major concern about them has been that their definitions might create loopholes through which they could be illegally used outside of their specialized applications. You should take some comfort in this regard from the way the coatings are defined in terms

of their unique chemistries and application environments. A good example of this is seen in the "thermoplastic rubber coatings and mastics" category, of which Inland Coatings is the primary manufacturer. I have attached its October 13, 2000 submission to you. As the letter indicates, this coating is such a specialized commercial coating that it is impossible to conceive of it being used as a general residential roof coating or wall paint.

I want to again emphasize our desire to work with you and your group at arriving at a sound rule for the Northeast Ozone Transport Region. You have stated that the rule will be open for revisions up until the Commission votes on it in March/April of 2001. I realize that does not leave much time, but we plan to continue to work with you and your workgroup to ensure that the best decision is made on the basis of the best possible information.

Sincerely,

Jim

Prepared 12/01/00

Industry Alternative Proposal

Suggested Table of Volatile Organic Compound (VOC) Content Limits For Architectural Coatings

[Unless otherwise specified, limits are expressed in grams of VOC per liter of coating thinned to the manufacturer's maximum recommendation excluding the volume of any water, exempt compounds, or colorant added to tint bases.]

Coating category	Effective January 1, 2005 Grams VOC per liter(a)
Antenna coatings	530
Anti-fouling coatings	450
Anti-graffiti coatings	600
Bituminous coatings and mastics	500
Bond breakers	600
Calcimine recoater	475
Chalkboard resurfacers	450
Concrete curing compounds	350
Concrete curing and sealing compounds	700
Concrete protective coatings	400
Concrete surface retarders	780
Conversion varnish	725
Dry fog coatings	400
Extreme high durability coatings	800
Faux finishing/glazing	350
Fire-retardant/resistive coatings:	
Clear	850
Opaque	450
Flat coatings:	
Exterior coatings	150
Interior coatings	150
Floor coatings	250(b)
Flow coatings	650
Form release compounds	450
Graphic arts coatings (sign paints)	500
Heat reactive coatings	420
High temperature coatings	650
Impacted immersion coatings	780
Industrial maintenance coatings	340
Lacquers (including lacquer sanding sealers)	680
Magnesite cement coatings	600
Mastic texture coatings	300
Metallic pigmented coatings	500
Multi-colored coatings	580
Nonferrous ornamental metal lacquers and surface protectants	870
Nonflat coatings:	250
High Gloss	380
Nuclear coatings	450

Pretreatment wash primers	780
Primer and undercoaters	200(c)
Specialty primers	350
Quick-dry coatings:	
Enamels.	380
Primers, sealers, and undercoaters	450
Repair and maintenance thermoplastic ctgs	650
Roof coatings	250
Rust preventative coatings	400
Sanding sealers	
(other than lacquer sanding sealers)	550
Sealers (including interior clear wood sealers)	350
Shellacs:	
Clear	730
Opaque	550
Stains:	
Clear and semitransparent	550
Opaque	350
Low solids (b)	120
Stain controllers	720
Swimming pool coatings	600
Thermoplastic rubber coatings and mastics	550
Traffic marking coatings	150
Varnishes	450
Waterproofing sealers and treatments	
Clear	400
Opaque	400
Wood preservatives:	
Below ground wood preservatives	350
Clear and semitransparent	550
Opaque	350
Low solids (b)	120

a. Compliance will be determined based on the VOC content limit, as expressed in metric units.
b. An alternate secondary recommendation would be offer a 250 g/l limit for waterborne and a 380 g/l limit for solvent borne.
c. This would include expanding the definition for specialty primer.

In order to implement this TOS, the following definitions need to be added to the Definitions Section of the Model rule

Nonflat – High gloss coating means a nonflat coating that registers a gloss of 70 or above on a 60 –degree meter according to ASTM Designation D523-89(1999).

Specialty primer means a coating formulated and recommended for application to a substrate to block stains, odors or efflorescence; to seal fire, smoke or water damage; to condition excessively chalky surfaces; or recommended for application to exterior wood or wood-based surfaces. An excessively chalky surface is one that is defined as having a chalk rating of four or less as determined by ASTM Designation D 4214-98 Photographic Reference Standard Nop.1 or the Federation of Societies For Coatings Technology " Pictorial Standards for Defects".

TECH Talk

Technological Challenge

Formulating low-solvent latex paints

By J. "Rusty" Johnson
Rohm and Haas Co.

The basic approach to creating a low-solvent latex paint is almost absurdly simple: eliminate the coalescent(s) from the formulation. Coalescent represents the sole significant source of solvent in a latex paint; remove it and you automatically have a "low-solvent" paint. Unfortunately, while the principle of formulating low-solvent paints is simple, putting that principle into actual practice is not.

The difficulty in formulating viable low-solvent paints revolves around film formation. For a paint film to form, binder particles must deform and fuse together. This process is easy to accomplish with inherently soft (low glass transition (Tg) temperature) binders.

They have fundamentally good polymer chain mobility, which permits the particle-to-particle molecular diffusion necessary for film formation. Harder binders lack this mobility; they must be "softened" by coalescing solvent before film formation occurs.

BALANCING FILM FORMATION & PERFORMANCE

In a low-solvent paint without coalescent, manufacturers are compelled to employ softer binders to achieve adequate film formation. The films developed, however, exhibit serious shortcomings: increased tack, decreased block and print resistance, and greater susceptibility to impact damage.

These limitations are of little concern in flat paints, which contain large proportions of hard pigment that reinforce the binder. Gloss and semigloss paints, however, do not contain enough pigment to compensate for the low-Tg binder.

ACHIEVING GOOD FILM PROPERTIES IN GLOSS PAINTS

Given the limitations of conventional soft binders, suppliers of solvent-free binders for gloss paints must compensate for the lower Tg through some mechanism-such as heterogeneity or crosslinking-that will reinforce and harden the polymer film.

For example, Rhoplex SF-012 emulsion, a solvent-free Rohm and Haas binder for interior semigloss paints, utilizes crosslinking to obtain film hardness. Unfortunately, these mechanisms all involve performance tradeoffs.

The greatest limitation of available solvent-free products and formulating approaches is the difficulty in simultaneously achieving a high level of performance in four key properties: low-temperature film formation, hardness/block resistance, scrub resistance, and freeze-thaw stability (1). Conventionally formulated paints have an advantage in this respect because the coalescent(s) (and other solvents) are fugitive. A coalescent remains in the paint only long enough for the film to form. The solvent then departs the film, which then exhibits the basic hardness furnished by the binder.

The difficulty in formulating viable low-solvent paints revolves around film formation.

The hard conventional binders supply good block resistance naturally; there is no need for heterogeneity or crosslinking. Moreover, obtaining good low-temperature film formation is simply a matter of adding enough coalescent to soften the binder at the minimum intended application temperatures.

In contrast, formulating with softer binders forces low-solvent paint makers to make some difficult choices. If they obtain good hardness and block resistance through such mechanisms as heterogeneity and crosslinking, low-temperature film formation may not be possible. In addition, the use of heterogeneity and a crosslinking mechanism typically has a detrimental effect on scrub resistance. Moreover, the absence of other solvents such as glycol makes freeze/thaw stability highly problematic.

CONCLUSION

Currently, there is no way to avoid the tradeoffs involved with today's "solvent-free" latex paints. It is *therefore important to educate consumers* about these compromises, so they are less likely to have unreasonable expectations.

The point to make in this regard is that solvent-free paints represent an evolving technology. With the resources committed to their development, these products will continue to improve, and the performance gap between conventional and low-solvent chemistry will diminish.

J. Rusty Johnson is market manager for wall binders, North America for Rohm and Haas Co. You can reach him at 215-592-3086.

ATTACHMENT E

NPCA STATEMENT OF CONCERNS WITH RECENT SCAQMD TECHNOLOGY STATUS REPORT