

ILLINOIS POLLUTION CONTROL BOARD
July 16, 1987

IN THE MATTER OF:)
)
VOLATILE ORGANIC MATERIAL) R82-14
EMISSIONS FROM STATIONARY)
SOURCES: RACT III)

PROPOSED RULE FIRST NOTICE

OPINION AND ORDER OF THE BOARD (by B. Forcade):

This matter comes before the Board on a series of proposed amendments to 35 Ill. Adm. Code Par 215, Organic Material Emission Standards and Limitations, for the control of the pollutant ozone. All of the proposed amendments address some aspect of the existing regulations controlling volatile organic material ("VOM") emissions from coating operations. Amendments to 35 Ill. Adm. Code 215.204, 215.205 and 215.207 will be considered in the instant opinion and order. Merit hearings on the proposed amendments were held on December 2-3, 1985; March 20-21, 1986; August 4, 1986; August 7, 1987; September 3-4, 1986; October 30, 1986; and November 7, 1986. Hearings regarding the Economic Impact Statement (EcIS) for Sections 215.204 and 215.207 were held on May 8 and 21, 1987. Final merit evidence was also accepted at these hearings. The record closed on June 30, 1987.

This is one of a series of Board actions directed at promulgating rules implementing reasonably available control technology ("RACT") for the control of ozone precursors from existing major stationary sources (emissions greater than 100 tons/year). The implementation of RACT in non-attainment areas for ozone is required as a part of a federally approvable state implementation plan ("SIP") under the federal Clean Air Act ("CAA") (42 U.S.C. 7401 et seq.). Section 172 of the CAA requires that RACT be implemented at existing stationary sources in the non-attainment areas of those states needing an extension from the 1982 deadline until 1987 to achieve the air quality standard for ozone. Illinois is such a state, having requested the extension in its 1979 and 1982 SIP.

The definition of RACT is contained in 40 CFR 51, along with the requirements for a federally acceptable SIP. However, the specific parameters of what constitutes reasonably available controls, and, therefore, the parameters which the states must

The Board acknowledges the contributions of David G. Mueller, hearing officer, in this proceeding.

adopt to insure that RACT is implemented, are not. Instead, the United States Environmental Protection Agency ("USEPA") publishes a series of documents entitled "Control Technique Guidelines" ("CTGs"). Each of the CTGs, which are summaries of industry specific case studies, contains the means and the degree of control which the USEPA requires the state to adopt categorically as part of its SIPs in order to have an acceptable SIP. Failure to adopt rules identical to those presented in the CTGs, or other ones demonstrated by the individual state as comparable, can mean that the state will have an inadequate SIP, which in turn can trigger the sanction provisions of the CAA found at Sections 110, 113 and 176 (42 U.S.C.A. 7410, 7413, 7506). While the mandate for sanctions is contained in the CAA, the mandate to adopt the CTGs or otherwise demonstrate a state rule to be comparable is not. It is not even contained in the federal regulations, but instead is articulated in the "General Preamble for Proposed Rulemaking and Approval of State Implementation Plan Revisions for Non-Attainment Areas" (44 FR 20372).

RACT regulations controlling VOM emissions from coating operations were adopted in the first RACT proceeding, R78-3,4, RACT I, (35 PCB 35-75, July 12, 1979). The rules at issue today, Sections 215.204, 215.205 and 215.207, address Emission Limitations from Manufacturing Plants, Alternative Emission Limitations and Internal Offset, respectively. The proposed amendments to these sections are intended to correct certain alleged deficiencies in the rules in order to reflect RACT and, in part, to respond to new guidance from the USEPA. Additionally, in the course of the proceeding, several site-specific amendments were proposed by industrial facilities in response to the proposed amendments to Section 215.204 and 215.207. Proposed amendments to each section will be addressed separately, below. However, certain conceptual elements of the proposed amendments are interrelated. Such interrelationships will be noted where possible.

I. Section 215.205: Alternative Emissions Standards

The Illinois Environmental Protection Agency ("Agency"), in its original regulatory proposal initiating the R82-14 proceeding, sought to amend Section 215.205 as adopted in R78-3, 4, RACT I (Ex. 1). Section 215.205 provides alternatives to the VOM limitations for surface coating operations contained in Section 215.204, by specifying emission standards based on add-on control equipment performance. Section 215.205 specifies minimum destruction efficiencies and overall control equipment efficiencies. Overall control efficiency is the product of the capture efficiency and the destruction efficiency. When the existing Section 215.205 was reviewed by USEPA as an amendment to the SIP, it found the rule to be possibly deficient. The Agency agreed to undertake a study evaluating achievable capture efficiency and submit any necessary amendments to Section 215.205

to the Board, thereby, acquiring conditional approval of that portion of the SIP (45 FR 1147 at 11482; Ex. 2). This study, prepared by the Radian Corporation, was submitted as Exhibit No. 11. The Agency's proposed amendments to Section 215.205 are based on this study.

Proposed Section 215.205 was inadvertently omitted from the Board's August 10, 1984, First Notice Order, due to a perceived nexus between it and the anticipated amendments to Section 215.207. On May 30, 1985, the Board proposed the Agency's amendments to Section 215.205 for first notice publication. The Agency further amended proposed Section 215.205 on November 22, 1985 (Ex. 87). Additional hearings regarding this rule were held on December 2, 1985, and March 20, 1986, at the request of the Chicago Association of Commerce and Industry (CACI).

The amendments proposed by the Agency to Section 215.205 are based on the Radian Study (Ex. 11). The Agency proposes to increase the overall control efficiency required at the process equipment for all types of surface coating facilities regulated under Section 215.204 from 75% to 81%, except for can coating. No change is proposed for can coating operations using add-on controls because the control efficiency at these sources remained undetermined by the study. The Radian Study found that a reasonably available collection efficiency ranged between 91 and 94 percent for paper coaters. Based on this, the 81 percent overall control efficiency figure is proposed for the remaining surface coaters. The Agency's amended proposal of November 22, 1985, adds language to make it clear that the overall emission reductions to be achieved when afterburners are used are 75 percent for the can coating category and 81 percent for all other categories of sources subject to Section 215.204.

The USEPA has indicated its willingness to accept regulations consistent with the Radian Study (Ex. 88, 49 FR 20522). The USEPA Notice of Proposed Rulemaking addressed several "conditions relating to the Illinois SIP" including the conditional approval of this regulation. In that notice, USEPA extended the date for satisfying this condition to July 31, 1984.

CACI opposes the proposed amendment and argues that the Radian Study provides an insufficient factual basis for adopting the Agency's proposal because the full spectrum of coating operations were not studied. CACI argues that only the paper coating category was studied and that not all Illinois paper coaters were included. CACI asserts that this provides an insignificant sample size (P.C. 73). CACI provides no evidence that the level of control in the Agency's proposed amendment is technically infeasible or economically unreasonable. Additionally, CACI points out the general problem of measuring capture efficiency and criticizes certain collection efficiency assumptions made in the Radian Study regarding paper coaters outside of Illinois (P.C. 73).

In response, the Agency presented additional evidence regarding the propriety of the 81 percent overall control efficiency and clarified how efficiencies could be calculated and measured in the context of a stack test (Ex. 95(a) and (b), Ex. 97(a) and (b)).

The Board is not persuaded by CACI's arguments. First, the results of the Radian Study support the "presumptive norm" of 81 percent in the earlier coating CTG. Second, while it may be preferable to work from a state of perfect knowledge, it is not always possible in the context of a regulatory proceeding. It is true that the Radian Study did not examine every coating operation throughout Illinois. However, that is not necessary in this context. The Board is presented with sufficient evidence that for most coating operations, 81 percent is a reasonable number. The Board is presented with no evidence to the contrary. Third, while CACI points out alleged defects in the Radian Study, these "defects" are not incorporated in the proposed amendments to Section 215.205. For example, CACI criticizes the 100 percent capture efficiency assumption in the Radian Study's review of non-Illinois coating facilities. However, the proposed rule only requires 90 percent capture efficiency. Fourth, the proposed amendment to Section 215.205 is not even as stringent as the results of the Radian Study could support. Focusing on the collection efficiency at Illinois paper coating facilities, the study determined that a reasonably available collection efficiency ranged between 91 and 94 percent. The proposed amendment provides an added cushion through the 81 percent overall efficiency requirement which translates to only a 90 percent capture requirement. As a final matter, if there are facilities in Illinois that, due to special circumstances, cannot comply with the proposed amendment, variance and site-specific regulatory relief are available under Illinois law.

The Board finds that the proposed amendments to Section 215.205 constitute RACT and will therefore propose this rule for first notice. This action will also help to remedy any possible SIP deficiencies and avoid sanctions under the CAA.

II. Section 215.204 - Emission Limitations for Manufacturing Plants

Section 215.204 prescribes VOM emission limitations for an array of coating process categories. The limitations of Section 215.204 are expressed in terms of kg/l or lb/gal of VOM, excluding water, delivered to the coating applicator. Some of the coating process categories specify a transfer efficiency. The Agency's proposed amendments to Section 215.204 would require the exclusion of certain organic solvents exempted from the definition of VOM from the calculation of the emission limitations. This Agency proposal was filed on March 13, 1986,

and amended on July 25, 1986. Hearings regarding this proposal were held on March 20, 1986; August 4 and 7, 1986; September 3-4, 1986; October 30, 1986; and November 7, 1986. The Department of Energy and Natural Resources ("DENR") filed an Economic Impact Study (EcIS) on March 13, 1987 (Ex. 142). EcIS hearings were held on May 8 and 21, 1987.

The rationale for the Agency's proposal to exclude certain compounds that are specifically exempted from the definition of VOM involves some review of past RACT regulations and their development over time. The original language for Section 215.204 was adopted as part of the RACT I proceeding (R78-3,4) and the definition of VOM at that time did not exclude any compounds which are liquids at room temperature capable of being used as solvents in coatings. In the original definition of VOM, only methane and ethane, which are gases at room temperature, were excluded as being negligibly photochemically reactive. Their exclusion had no effect on volume calculations under Section 215.204.

However, in the RACT II proceeding (R80-5) and this RACT III proceeding (R82-14), other compounds which are liquids capable of being used as coating solvents have been exempted from the definition of VOM because they are negligibly photochemically reactive. Methylene chloride and 1,1,1-trichloroethane were excluded in RACT II and seven more compounds were excluded in RACT III. The Agency contends that since these compounds do not contribute to emissions of VOM, it is necessary to subtract their volume from the volume of coating in the same way that the volume of water is subtracted from the volume of coating under the present regulations. It is the Agency's position that if this subtraction were not done, then the numerical limitations of Section 215.204 are circumvented. An unintended inequity exists which favors coatings using the excluded compounds relative to water based coatings and high solids coatings (Ex. 120, 132 and 135).

There are two basic methods by which exempt compounds can be used to reformulate non-complying coatings, i.e., 1) dilution, and 2) direct substitution for VOM. In the first method, the coating is simply diluted by adding an exempt compound. The Agency contends that it does not make sense to allow greater emissions from the additional gallons of coating applied when the volume of solvent contributing to emissions of VOM is the same. Thus, in simple dilution by adding an exempt compound, the exempt compound should be treated as water, i.e., as not contributing to emissions or coating volume.

In the second method, exempt compounds are substituted for solvents which would contribute emissions of VOM. Since the compounds substituted for original solvent do not contribute to emissions of VOM the facility reduces its VOM emissions.

However, the volume of exempt compounds must still be subtracted in determining allowable emissions in order to achieve equivalency with the numerical limitation. The Agency argues that the exempt compound should be treated as water since there will be lower VOM emissions as well as lower coating volume. To the extent that the emissions have been reduced relative to the coating volume, this will result in what the Agency calls the proper RACT ratio. In the case of complete substitution of the original solvent with exempt compound, the RACT ratio will be zero since there are no volatile organic emissions which is again equivalent with treating the exempt solvents as water.

It is the Agency's position that retaining the volume of "excluded" compounds in the coating volume is inconsistent with the limits of Section 215.204, as they represent the use of RACT. The limits of Section 215.204 reflect a ratio between VOM emissions and the solids contained in a coating. For example, an emission limit of 3.0 lb/gallon represents a coating with approximately 40 percent VOM and 60 percent solids for a RACT ratio of 2:3. When the volume of exempt compounds is included in the total volume of coating, the ratio of VOM to solids deviates from the RACT ratio represented by the numerical limitation. For example, a coating might contain only 40 percent VOM, 30 percent solids, and 30 percent exempt compounds. In this case, the ratio of VOM to solids is 4:3. Another way of making the comparison would be to say that for each gallon of solids in the complying coating, 2/3 gallon of VOM is allowed. However, with the second example, for each unit of solids, 4/3 gallon of VOM is allowed which is twice as much VOM relative to the solids than would be allowed by the complying coating. The Agency contends that any coating with a ratio of VOM to solids greater than that of the complying coating would not constitute RACT as defined by the numerical limitations in Section 215.204.

In the extreme case of pure dilution, exempt compounds might be used to dilute a formerly non-complying coating so that it complies with the numerical limit of Section 215.204 but with no reduction in actual VOM emissions from the coating. This situation is the same as that which led to the exclusion of water from the coating volume for purposes of Section 215.204. In order to assure that the limits of Section 215.204 do represent a coating equivalent to the RACT limitations, the volume of exempt compounds must also be excluded from the total volume of coating.

The Agency contends that USEPA guidance on this subject is "quite clear" and cites an article written by USEPA employees, regarding the appropriate method of calculation, USEPA's "VOC Data Sheet for Suppliers of Paints and Coatings" and an issue of USEPA's "VOC RACT Clearinghouse Newsletter" which address this issue (Ex. 120). It is the Agency's position that its proposed amendment will not result in any substantive change in the emission limitations of Section 215.204, but merely provides

"clarification" on the appropriate method of calculation (Agency Response to Order, May 21, 1987).

The primary opposition to the proposed amendments to Section 215.204 has come from the Duo Fast Corporation ("Duo Fast"). While Duo Fast and the Agency eventually came to agreement regarding appropriate emission limitations for coatings for the power driven fastener industry, it is worthwhile reviewing Duo Fast's arguments. Essentially, Duo Fast contends that the Agency's proposal oversimplifies the realities of coating chemistry and formulation. The consequence of emission limitations based on this simplified view of coatings is that compliance coatings are technically infeasible to apply, at least in the power driven fastener industry. More specifically, Duo Fast contends that there is no known coating chemistry that can achieve compliance with the proposed change (R. 3390).

The Agency proposal was criticized for only "partially" recognizing that water's mass and volume should be excluded from the regulations pertaining to organic materials. Also, Duo Fast contends that the Agency's testimony is flawed by stating a "ratio" of emissions to solids exists as a part of RACT. According to the Duo Fast argument, the amendment ignores the key term: "delivered to the coating applicator." According to one witness, the Agency devised its ratio assuming that the coating is delivered to the applicator in a solvent-free state.

"The true volume of the solvated polymer is physically and significantly different as delivered to the Coating Applicator. After application to the substrate to be coated, the mechanism of solvent release occurs and solvent release continues until it is complete. In a coating operation, generally a film is formed which represents both volume and mass of solids. It is critically important to be aware that for different organic polymeric resin systems, there are differing solvent release mechanisms and solvent release rates. How is it valid to make an 'after the fact' assumption regarding volume solids applied in the state of a solvent free condition when the Rule makes a very specific requirement specifying the coating condition as 'delivered to the Coating Applicator'." (R. 4659-4660).

Duo Fast also contends that the coating listed in the Miscellaneous Metal Parts and Products of 4.3 lb VOM per gallon is impossible to formulate and to utilize on Duo Fast equipment or any other known technology of similar nature. Since Duo Fast is required to use the cellulose ester resin polymer system in

its manufacturing process, the coating that would be required to meet the Agency's description would be impossible to apply (R. 4660-4661).

Ultimately, Duo Fast and the Agency came to agreement that the power driven fastener industry, and Duo Fast in particular, presented a unique situation that justified special emission limitations. Duo Fast and the Agency proposed a further amendment to Section 215.204, which provides RACT limitations for power driven fastener coating. This proposal will be addressed in Section III of this opinion, further below. However, the net effect of this amendment is to ameliorate any adverse impact to Duo Fast as a result of the Agency's proposal to exclude exempt solvents from the calculation of emission limitations.

It appears from the record before the Board that the Agency's proposal to exclude exempt solvents from the calculation of Section 215.204 emission limitations is an appropriate method of determining VOM emissions for a particular coating. The proposed amendment will ensure that dilution with exempt solvents will not be used as a method of compliance, just as dilution with water is currently prevented. Direct substitution of VOM solvents with exempt solvents will continue to be a permissible method of formulating compliant coatings.

Regarding Duo Fast's conceptual arguments in opposition to the proposed amendment, the Board makes the following observations. It appears that for Duo Fast's specialized coating process, the Agency's proposal would create serious compliance problems in terms of the practical realities of applying such a coating. However, this appears to be a unique situation not necessarily experienced by the majority of coaters. It appears that the unique circumstances of the power driven fastener industry, and Duo Fast in particular, will be adequately addressed by the special RACT emission limitation jointly proposed by Duo Fast and the Agency. The record indicates that only two facilities would have their compliance status affected by the Agency's proposal. Both Duo Fast and Classic Finishing Company have worked with the Agency and have formulated or are in the process of formulating specialized emission limitations that reflect RACT for their unique coating processes. Consequently, the Board believes that the Agency's proposal is generally a sound and improved method of determining emissions from coatings. In limited circumstances, it may create technical feasibility problems for certain types of coating applications. However, those rare situations are being addressed through specific emission limitations tailored to the unique coating process.

The practical effect of the Agency's proposal will be to change the emission limitations currently in Section 215.204 for those coaters who utilize exempt solvents. While the amendment

clarifies the calculation method, it is also apparent that some of the applicable coating limitations are substantively changed. However, this substantive change only affects the compliance status of two facilities, which will be the subject of specialized limitations. Therefore, the actual economic impact of the proposal, when viewed in total, is very limited. The proposed amendment clarifies and tightens the calculation of emission limitations for coaters. It is hoped that this amendment will close a potential "loophole" in determining compliance under Section 215.204.

The Board finds that the proposed amendments to Section 215.204 constitute RACT and will therefore propose this rule for first notice. This action will help to remedy any possible SIP deficiencies and avoid sanctions under the CAA.

III. Section 215.204(j) - Power Driven Fastener Coating

During this proceeding, Duo Fast was identified as potentially adversely impacted by the Agency's proposed amendments to Sections 215.204 and 215.207. Duo Fast participated extensively in the hearings and presented testimony in opposition to the general principles embodied in the Agency's proposals, as well as testimony demonstrating that the proposal was not technically feasible, economically reasonable or RACT for Duo Fast. At the close of the merit record, the Agency proposed amendments to Section 215.204(j), which would provide special emission limitations for power driven fastener coating that reflect RACT for this subcategory of miscellaneous metal coating (Agency Motion to Further Amend, December 10, 1986). Duo Fast, in its final comments in this matter, advocates adoption of the Agency's proposed 215.204(j) limitations in the event the Board decides to adopt the Agency's proposal to exclude exempt solvents from the calculation of emission limitations in 215.204 and 215.207 (Closing Statement of Duo Fast Corporation, June 30, 1987).

Duo Fast operates a facility in Franklin Park (Cook County), which manufactures a multitude of power driven fasteners, nails and power driven fastener tools. Duo Fast employs approximately 1,100 people at this facility. Duo Fast's distinct and unique coating operations are carried out on a large number of conventional staple making machines and five newer multi-wire staple making machines. (The term "staple" also includes certain brad and finish nail fasteners.) The conventional machines apply small amounts (i.e., less than 1/2 pound of organic emissions/hour, total) of bonding, lubricity and withdrawal resistance coatings at three separate stations. The multi-wire machines apply somewhat larger amounts of a single multi-purpose coating. The total organic emissions of the conventional machines are approximately 140 tons/year at present (see Emission Report from Duo Fast, dated October 17, 1986, Attachment 10).

The total organic emissions of multi-wire machines are presently about 50 tons/year and are limited to 80.3 tons/year by a permit condition imposed to establish non-applicability of 35 Ill. Adm. Code Part 203. In the absence of site-specific consideration for Duo Fast, the changes proposed by the Agency to Section 215.204 would result in non-compliance of certain Duo Fast coating operations.

Duo Fast presently appears to be in line-by-line compliance with the current emission limitations of Section 215.204 through the use of combination materials which perform both adhesive and coating functions and reformulation by substituting non-photo-chemically reactive solvents for VOMs (Closing Statement of Duo Fast Corporation, June 30, 1987). Before the development of combination materials, Duo Fast relied on the existing internal offset rule to achieve compliance.

Duo Fast presented evidence of its efforts, over the years, to reduce organic emissions by reformulation of its coatings, as well as process changes (Exs. 92, 93, 125). The record also contains considerable information on the uniqueness of Duo Fast's staple making equipment, its coating operation and the functions which the coatings serve, as compared to other miscellaneous metal parts and products coating operations. Unique features include the high degree of automation, low rates of coating application per applicator, high transfer efficiency, limited curing time, lack of enclosure, role of bonding coating and need for immediate function, end use of product, and specialization of coating function in end use of product. Considering these technological constraints, Duo Fast appears to have made substantial efforts to reformulate coatings to comply with the present Section 215.204(j) by the principal means available, use of exempt organic compounds. However, the limit of organic emission reduction achievable with this means also seems to have been reached (P.C. 99).

Duo Fast investigated compliance through the use of add-on control equipment as an alternative to further reformulation of coatings to meet the new limitations that would be applicable under the Agency's proposed amendment to Section 215.204. Duo Fast had a detailed "Control Equipment Evaluation" prepared by Yates & Auberle, Ltd. (Y&A). The evaluation considered combined and separate control of conventional machines and multi-wire machines using a catalytic oxidizer, a thermal oxidizer with high efficiency heat transfer and an adsorption-oxidizer system. Y&A estimated that the cost effectiveness of the control equipment necessary to achieve compliance would be \$10,000/ton. The Agency and EcIS both adjusted this figure but still came to the conclusion that the cost was well above the levels usually

accepted as RACT (approximately \$2,000/ton)* (P.C. 99, Ex. 142).

Additionally, there are uncertainties regarding the actual technical feasibility of the control systems costed-out by Y&A in its study. The emissions capture system may have to be revised after a pilot study, which could increase the cost of compliance. The extensive use of methylene chloride will lower the organic emissions cited in the Y&A study. Costs will also be added to the Y&A estimates to account for scrubbing of hydrogen chloride in the gas stream following the afterburner.

The Agency and Duo Fast also looked to similar facilities throughout the country in order to determine what RACT might be for this specialized industry. Other major companies in the power driven fastener industry appear to have been less successful than Duo Fast in complying with RACT regulations and are the subject of state and federal enforcement actions and consent decrees setting stringent compliance deadlines (P.C. 99). Many of these compliance deadlines have been unattainable (Closing Statement of Duo Fast Corporation, June 30, 1987).

The Agency has proposed a revision to 35 Ill. Adm. Code 215.204(j) to specifically address organic material emissions from Duo Fast's coating operations. (Agency Motion to Further Amend 35 Ill. Adm. Code Sections 211.122 and 215.204, December 10, 1986.) This revision proposed specific emission limits, in pounds of organic material per gallon of coating, for four distinct and unique coating operations at Duo Fast. It also includes a reference for nail coating, Duo Fast's other type of operation, to present limits applicable to miscellaneous metal parts and products coating. The proposal does not identify Duo Fast by name, but rather applied to "Power Driven Fastener Coating." Duo Fast is believed to be the only facility engaged in such coating in Illinois, as the term is defined.

The Board will propose, for first notice, the proposed amendments to Section 215.204(j), which would provide special limitations reflecting RACT for the power driven fastener industry. Duo Fast has made a showing that the limitations of Section 215.204 as modified by the Agency's proposal to exclude exempt solvents would not be RACT for the power driven fastener industry in Illinois. The Board believes that the record adequately supports special limitations that should be federally approvable.

The Board notes that this RACT cost-effectiveness figure is a rough estimate that does vary. Cost-effectiveness for RACT has been expressed within the range of \$1,800 - \$2,500/ton by various sources.

IV. Section 215.204(c) - Specialty High Gloss Catalyzed Coating

Classic Finishing Company ("Classic") was identified, relatively late in this proceeding, as having its compliance status affected by the Agency's proposal to exclude exempt solvents from the emission limitation calculations in Section 215.204. Classic operates a facility in Chicago (Cook County) which provides specialty finishes to preprinted products on a job-shop basis. These coating and lamination processes fall into the category of paper coating. Classic operates four solvent-borne top coating lines and two UV coating lines. Classic has achieved compliance with existing Section 215.204 through reformulation of its solvent-borne top coating to contain 1,1,1-trichloroethane, an exempt solvent, and through the use, where possible, of solventless UV coating.

Classic presented evidence of its research and development efforts to date which demonstrate that little further VOM emission reductions are possible through further coating reformulation or switching to UV coating. Water-borne coatings have been investigated but are not available for this specialized category of paper coating (R. 4840-4845). Add-on controls were investigated but even preliminary engineering costs would exceed the rough benchmark of \$2,000/ton which is commonly used as a RACT guideline (R. 4935). Add-on controls would reduce VOM emissions by approximately three tons/year at a minimum cost of \$8,000 to \$10,000 tons/year (R. 4928-4931). The Agency's proposal to exclude exempt solvents from the calculation of Section 215.204 limitations would mean that over 40% of Classic's coating operations would be out of compliance with no realistic method available to continue operations (R. 4843-44).

Because of the specialized nature of Classic's coating operations and job-shop business, recent significant VOM reductions through reformulation and UV coating, the limited prospect of further significant emission reductions, the high cost of add-on controls and the relatively small amount of emissions at issue the Agency proposed special VOM emission limitations for "Specialty High Gloss Catalyzed Coating" (Agency Motion to Further Amend, December 10, 1986). Classic is believed to be the only facility engaged in such coating in Illinois, as this term is defined. The Agency and Classic both agree that these proposed amendments to Section 215.204(c) better reflect RACT for this special subcategory of paper coating.

The Board will propose, for first notice, the amendments to Section 215.204(c) which would provide special limitations reflecting RACT for the specialty high gloss catalyzed coating industry. Classic has made a showing that the limitations of Section 215.204 as modified by the Agency's proposal to exclude exempt solvents would not be RACT for this special category of

paper coating in Illinois. The Board believes that the record adequately supports special limitations that should be federally approvable.

V. Section 215.207 - Aggregation of Emission Sources

The Agency proposes to amend existing Section 215.207, Internal Offsets, by changing the method of calculation of VOM from a volumetric basis to a solids basis, as well as to generally revise the rule. The Agency proposes to amend Section 215.207 by: 1) changing the heading of the section to make it more descriptive of the actual intent and to avoid confusion with offsets under Part 203 and the Prevention of Significant Deterioration ("PSD") program; 2) substituting language parallel to Section 215.205 in paragraph (a) in order to reference the emission limitations of Section 215.204; 3) clarifying language and use of abbreviations; 4) including a formula for converting from lb/gal (from Section 215.204) to lb/gal solids, for the purposes of calculating compliance to Section 215.207; and 5) amending the definition of the symbols B and n as used in the two formulae.

It is worthwhile to briefly review the history of Section 215.207 and the genesis of the Agency's proposal. The internal offset rule was adopted in the RACT I (R78-3,4) proceeding and was conditionally approved by USEPA as a SIP revision (45 FR 11482, Ex. 2). However, USEPA subsequently proposed to disapprove the rule after finding an error in the specified equation (50 FR 28226, Ex. 89, Attachment 1). The Agency originally proposed to revise Section 215.207 in the original proposal which initiated the instant proceeding on June 29, 1982 (Ex. 1). The amendments to Section 215.207 were originally proposed to make the Illinois regulation consistent with federal policy. USEPA guidelines indicated a problem in calculating equivalence when control equipment, rather than high solids or water-based coatings, was used to achieve compliance. Therefore, the amendments required calculation of emissions expressed in terms of the mass of VOM per volume of solids consumed.

Early in the proceeding, the Agency found no plants using Section 215.207 as a basis for compliance that would exceed the limitations based on the revised calculation. However, subsequently the Agency determined that there might be plants which would not comply with the amended rule, if adopted. Consequently, the Agency recommended in its comments on the Board's First Notice Order of August, 1984, that the Board defer action on this section until the data on affected plants was reviewed (P.C. 57). On August 23, 1985, the Agency filed a motion to reopen the record concerning, among other sections, Section 215.207, after the Agency's search for affected plants had been completed (Ex. 86). On November 22, 1985, the Agency further amended proposed

Section 215.207 (Ex. 87). Hearings were held on the Agency's amended proposal on December 2, 1985; March 20-21, 1986; August 4 and 7, 1986; September 3-4, 1986; October 30, 1986; and November 7, 1986. The DENR filed an EcIS addressing, in part, proposed amendments to Section 215.207 on March 13, 1987 (Ex. 142). EcIS hearings were held on May 8 and 22, 1987.

Section 215.207, both existing and as proposed to be amended, provides an alternative means of compliance with the emission limitations of Section 215.204 by offsetting overcomplying VOM emission sources with undercomplying VOM emission sources. For the purposes of illustration, suppose a coating facility operates two coating lines. The first line is able to "overcomply," i.e., it not only achieves, but surpasses the applicable VOM emission limits and thus generates an emissions credit. The second coating line is not in compliance but operates in excess of the applicable VOM standards. Under an offset, bubble or aggregation rule, the facility may be able to come into compliance by balancing its "credits" for overcompliance against the excess VOM emissions from its undercomplying coating line. Section 215.207 allows an alternative means of compliance with Section 215.204 by aggregating emissions across different coatings and coating lines at each facility.

Section 215.207 provides the framework, restrictions and equations for calculating compliance through offsetting or aggregating sources. Emission credits can be generated from overcomplying coatings, add-on control equipment or even elimination of certain VOM emission generating sources within a facility. Section 215.207 affects a variety of sources and is implemented in a unique way at each facility. The rule allows a certain flexibility in complying with the emission limitations of Section 215.204 and represents a compromise between line-by-line compliance and technical and economic feasibility. At the state level, Section 215.207 relates back to the limitations in Section 215.204 which represent RACT for various coating categories. At the federal level, the USEPA considers compliance under Section 215.207 to be within the scope of the federal Bubble Policy. Compliance plans and permits for facilities located in areas designated as non-attainment for ozone which are based on Section 215.207 must be submitted as SIP amendments to USEPA. The general rule itself is also a part of the SIP and any amendment to the general rule requires amending the SIP.

The Agency, in support of its proposal, contends that USEPA has found existing Section 215.207 to be deficient because of the way in which the determination of allowable emission is made. The present rule contains a mathematical formula based on the total-volume of coating used, as distinguished from solids present in the coating. Technically, this deficiency causes the rule to give results in certain circumstances which are not equivalent to the emission limitations of Section 215.204. This

is because the total-volume calculation does not consider the two-fold effect of the limits of Section 215.204. Not only do these limits reduce the amount of organic material in each gallon of coating, but they also may reduce the total gallons of coating which must be used. The less organic material or solvent contained in a coating, the more pigment, resin, binders, etc., commonly known as solids. Thus, fewer actual gallons of a compliance coating will probably be needed than were used before.

The substantive change in the proposed rule is intended to correct this deficiency in calculation method. This correction also necessitates the addition of a formula to convert the limits of Section 215.204 into equivalent solids-basis limits, and development of the recordkeeping requirement to include data on a solids-basis.

Section 215.207 has been considered deficient by USEPA for some period of time. The rule was originally submitted to the USEPA in 1979, as part of Rule 205(n). Upon submission of the rule (now codified as 215.207) as a part of proposed RACT II, the USEPA clarified the true deficiency of the rule: the equation concerning the internal offset provision contained the error previously discussed. Hence, in order for the rule to be approved as a SIP revision, it must conform with the consistently endorsed method of solids-based calculations.

A further justification of the proposed amendment is that the volume-based calculations now in place may lead to emissions levels which are also potentially inequitable. The solids-based calculations provide allowable emissions which are fixed and do not change with differing compliance options (reformulation, control equipment, etc.). However, it may be the case that the total-volume method will yield emissions limits which are not equivalent to those specified in Section 215.204, depending upon the compliance option chosen. Hence, the potential for inequity is present, in that facilities choosing certain compliance options may be allowed higher emissions than similar facilities choosing less "advantageous" options.

Many facilities use Section 215.207 throughout the state. However, only a handful of facilities were identified as possibly having their compliance status affected by the proposed change from volumetric to solids calculation. During the course of these proceedings, Allied Tube and Conduit of Harvey, which had been identified as having its compliance status affected by the proposed rule change, achieved a technological breakthrough that results in line-by-line compliance. Consequently, this facility is no longer affected by the proposed change. Duo Fast utilized existing Section 215.207 to achieve compliance and would have been affected by the proposed change. However, through a combination of a technological break in the area of "combi-cements" and the special proposed emission limitations for power driven

fastener coating, Duo Fast is no longer affected by the proposed amendment.

The Minnesota Mining and Manufacturing Company (3M) utilizes Section 215.207 to achieve compliance at its Bedford Park facility. 3M believes it can comply with the solids-basis calculation but has proposed a site-specific rule as an alternative to proposed Section 215.207 (Ex. 98). By joint motion dated June 30, 1987, the Agency and 3M have requested that the record remain open until July 30, 1987, regarding the 3M site-specific proposal. Consequently, the Board will defer action on 3M's proposal pending further informational development by the Agency and 3M. The impact of proposed Section 215.207 on the 3M will not be addressed in the instant opinion and order, but will be similarly deferred.

The primary argument against the solids-basis type of calculation is made by Duo Fast regarding the nature of polymer coatings wherein the solids are inextricably tied in with the solvent (either VOM or exempt). Based on this, the Duo Fast testimony of D.J. Kurr (R. 4659-4660) poses the question:

"How is it valid to make an 'after the fact' assumption regarding volume solids applied in the state of a solvent free condition when the Rule makes a very specific requirement specifying the coating condition as 'delivered to the Coating Applicator'?"

Duo Fast has presented a compelling point, as the solids based calculation would apply to its unique polymer coatings. However, the proposed special power driven fastener emission limitations proposed today appear to take this uniqueness into account. There is no evidence in the record that the other facilities that utilize Section 215.207 will be similarly affected by the proposed change. The record does indicate that since the solvent is finally released from the substrate on curing or drying, the Agency's arguments for a solids-based calculation are still valid. In terms of emission of VOM, the solids-based calculations appear preferable to the existing volumetric method.

The Board finds that the proposed amendments to Section 215.207 corrects an error in the existing rule and results in an accurate calculation of RACT limitations. The Board proposes this rule for first notice comment. This action will help to remedy any possible SIP deficiencies and avoid sanctions under the CAA. In reviewing the Agency's proposal, the Board wishes to note certain potential problems in the current drafting of the rule. In the proposed Section 215.207(a), it states that "methods or procedures used to determine emissions of VOM under this Section shall be approved by the Agency." These methods and

procedures are not specified and need to be addressed by the Agency. The Board has concerns regarding the JCAR approvability of this language. Section 215.207(a) also uses the term "selected coating lines" to replace the term "all coating lines." It is not clear what the basis of the selection is or who selects the lines that will be subjected to the limitations of the section. This topic needs to be addressed as well by the Agency. Based on the May 20, 1987, Agency Response to Hearing Officer Order, the definition for the term R_i in Section 215.207(c) should be changed as follows to be consistent with the proposed interpretation of gallon of coating in Section 215.204:

R_i = the applicable volatile organic material emission limit pursuant to Section 215.204, for a coating in Kg/l (lb/gal)

Additionally, the Board believes that adding "volatile organic material" before the word "emissions" in the definitional terms E_{ALL} , E_{ACT} , R_i and S_i would help to clarify those terms in Section 215.207(c).

The Board solicits comments on these issues.

ORDER

The following amendments to 35 Ill. Adm. Code Parts 211 and 215 are directed to the Secretary of State for First Notice publication in the Illinois Register.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER c: EMISSION STANDARDS AND LIMITATIONS
FOR STATIONARY SOURCES

PART 211
DEFINITIONS AND GENERAL PROVISIONS

SUBPART A: GENERAL PROVISIONS

Section
211.101 Incorporations by Reference
211.102 Abbreviations and Units

SUBPART B: DEFINITIONS

Section
211.121 Other Definitions
211.122 Definitions

Section 211.122 Definitions

"Power Driven Fastener Coating": The coating of nail, staple, brad and finish nail fasteners where such fasteners are fabricated from wire or rod of 0.254 inch diameter or greater, where such fasteners are bonded into coils or strips, such coils and strips containing a number of such fasteners, which fasteners are manufactured for use in power tools, and which fasteners must conform with formal standards for specific uses established by various federal and national organizations including Federal Specification FF-N-105b of the General Services Administration, Bulletin UM-25d of the U.S. Department of Housing and Urban Development - Federal Housing Administration and the Model Building Code of the Counsel of American Building Officials, and similar standards. For the purposes of this definition, the terms "brad" and "finish nail" refer to single leg fasteners fabricated in the same manner as staples. The application of coatings to staple, brad, and finish nail fasteners may be associated with the incremental forming of such fasteners in a cyclic or repetitious manner (incremental fabrication) or with the forming of strips of such fasteners as a unit from a band of wires (unit fabrication).

"Specialty High Gloss Catalyzed Coating": commercial contract finishing of material prepared for printers and lithographers where the finishing process uses a solvent-borne coating, formulated with a catalyst, in a quantity of no more than 12,000 gallons/year as supplied, where the coating machines are sheet fed and the coated sheets are brought to a minimum surface temperature of 190 F., and where the coated sheets are to achieve the minimum specular reflectance index of 65 measured at a 60 degree angle with a gloss meter.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER c: EMISSION STANDARDS AND
LIMITATIONS FOR STATIONARY SOURCES

PART 215
ORGANIC MATERIAL EMISSION STANDARDS AND LIMITATIONS

SUBPART A: GENERAL PROVISIONS

Section
215.100 Introduction
215.101 Clean-up and Disposal Operations
215.102 Testing Methods
215.103 Abbreviations and Conversion Factors
215.104 Definitions
215.105 Incorporations by Reference
215.106 Afterburners

SUBPART B: ORGANIC EMISSIONS FROM STORAGE
AND LOADING OPERATIONS

Section
215.121 Storage Containers
215.122 Loading Operations
215.123 Petroleum Liquid Storage Tanks
215.124 External Floating Roofs
215.125 Compliance Dates and Geographical Areas
215.126 Compliance Plan

SUBPART C: ORGANIC EMISSIONS FROM
MISCELLANEOUS EQUIPMENT

Section
215.141 Separation Operations
215.142 Pumps and Compressors
215.143 Vapor Blowdown
215.144 Safety Relief Valves

SUBPART E: SOLVENT CLEANING

Section
215.181 Solvent Cleaning in General
215.182 Cold Cleaning
215.183 Open Top Vapor Degreasing
215.184 Conveyorized Degreasing
215.185 Compliance Plan

SUBPART F: COATING OPERATIONS

Section
215.202 Compliance Schedules
215.204 Emission Limitations for Manufacturing Plants
215.205 Alternative Emission Limitations
215.206 Exemptions from Emission Limitations
215.207 Internal Offsets Compliance by Aggregation of Emission
Sources
215.208 Testing Methods for Solvent Content

- 215.209 Exemption from General Rule on Use of Organic Material
- 215.210 Alternative Compliance Schedule
- 215.211 Compliance Dates and Geographical Areas
- 215.212 Compliance Plan
- 215.213 Special Requirements for Compliance Plan

Section 215.204 Emission Limitations for Manufacturing Plants

No owner or operator of a coating line shall cause or allow the emission of volatile organic material to exceed the following limitations on coating materials, excluding water and any compounds which are specifically exempted from the definition of volatile organic material pursuant to this Part, delivered to the coating applicator:

a) Automobile or Light Duty Truck Manufacturing Plants

1)	In Cook County	kg/l	lb/gal
	Prime coat	0.14	(1.2)
	Prime surfacer coat	0.34	(2.8)

(Board Note: The prime surfacer coat limitation is based upon a transfer efficiency of 30 percent. The prime surfacer coat limitation shall not apply until December 31, 1982.)

Top coat	0.34	(2.8)
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(Board Note: The limitation is based upon a transfer efficiency of 30 percent. The top coat limitation shall not apply until December 31, 1985.)

Final repair coat	0.58	(4.8)
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(Board Note: The limitation shall not apply until December 31, 1985)

2)	In Boone County		
	Prime Coat	0.14	(1.2)
	Prime coat surfacer	0.34	(2.8)
	Top coat	0.34	(2.8)

(Board Note: The top coat limitation shall not apply if by December 31, 1984, a limitation of 0.43 kg/l (3.6 lb/gal) is achieved and the top coat is applied with a transfer efficiency of not less than 55 percent and by December 31, 1986, the top coat is applied with a transfer efficiency of not less than 65 percent)

	Final repair coat	0.58	(4.8)
3)	In the remaining counties		
	Prime coat	0.14	(1.2)
	Prime surfacer coat	0.34	(2.8)
	Top coat	0.34	(2.8)
	Final repair coat	0.58	(4.8)
b)	Can Coating		
1)	Sheet basecoat and Overvarnish	0.34	(2.8)
2)	Exterior basecoat and overvarnish	0.34	(2.8)
3)	Interior body spray coat	0.51	(4.2)
4)	Exterior end coat	0.51	(4.2)
5)	Side seam spray coat	0.66	(5.5)
6)	End sealing compound coat	0.44	(3.7)
c)	Paper Coating		
1)	<u>All paper coating except as provided in sub section (c)(2)</u>	0.35	(2.9)
2)	<u>Specialty High Gloss Catalyzed Coating</u>	0.42	(3.5)
	(Board Note: The <u>These</u> limitations shall not apply to equipment used for both printing and paper coating)		
d)	Coil Coating	0.31	(2.6)
e)	Fabric Coating	0.35	(2.9)
f)	Vinyl Coating	0.45	(3.8)
g)	Metal Furniture Coating	0.36	(3.0)
h)	Large Appliance Coating	0.34	(2.8)

(Board Note: The limitation shall not apply to the use
of quick-drying lacquers for repair of scratches and
nicks that occur during assembly, provided that the
volume of coating does not exceed 0.95 liters (1 quart)
in any one eight-hour period)

i)	Magnet Wire Coating	0.20	(1.7)
j)	Miscellaneous Metal Parts and Products Coating		
1)	Clear coating	0.52	(4.3)
2)	Air dries coating	0.42	(3.5)
3)	Extreme performance coating	0.42	(3.5)
4)	<u>Power driven fastener coating</u>		
A)	<u>Nail coating</u>		<u>Refer to limits in (j)(1), (2), (3) and (5)</u>
B)	<u>Staple, brad and finish nail unit fabrication bonding coating</u>	<u>0.64</u>	<u>(5.3)</u>
C)	<u>Staple, brad and finish nail incremental fabrication lubricity coating</u>	<u>0.64</u>	<u>(5.3)</u>
D)	<u>Staple, brad and finish nail incremental fabrication withdrawal resistance coating</u>	<u>0.60</u>	<u>(5.0)</u>
E)	<u>Staple, brad and finish nail unit fabrication coating</u>	<u>0.64</u>	<u>(5.3)</u>
45)	All other coatings	0.36	(3.0)

(Board Note: The least restrictive limitation shall apply if more than one limitation pertains to a specific coating)

k)	Heavy Off-highway Vehicle Products		
1)	Extreme performance prime coat	0.42	(3.5)

2)	Extreme performance top coat-air dried	0.52	(4.3)
3)	Final repair coat-air dried	0.58	(4.8)
1)	Wood Furniture Coating		
1)	Clear topcoat	0.67	(5.6)
2)	Opaque stain	0.56	(4.7)
3)	Pigmented coat	0.60	(5.0)
4)	Repair coat	0.67	(5.6)
5)	Sealer	0.67	(5.6)
6)	Semi-transparent stain	0.79	(6.6)
7)	Wash coat	0.73	(6.1)

(Board Note: The repair coat has overall transfer efficiency of 30 percent; all others have an overall transfer efficiency of 65 percent.)

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 215.205 Alternative Emission Limitations

Owners or operators of coating lines subject to Section 215.204 may comply with this Section, rather than with Section 215.204. The methods or procedures used to determine emissions of organic material under this ~~s~~Section shall be approved by the Agency. Emissions of volatile organic material from sources subject to Section 215.204, are allowable, notwithstanding the limitations in Section 215.204, if such emissions are controlled by one of the following methods:

- a) For those sources subject to Section 215.204(b), the emissions are controlled by an afterburner system which provides: 7 provided that 75 percent of the emissions from the coating line and 90 percent of the nonmethane volatile organic material (measured as total combustible carbon) which enters the afterburner are oxidized to carbon dioxide and water; or
 - 1) 75% reduction in the overall emissions of volatile organic material from the coating line, and

- 2) Oxidation to carbon dioxide and water of 90% of the nonmethane volatile organic material (measured as total combustible carbon) which enters the afterburner.
- b) For all other sources subject to 215.204, the emissions are controlled by an afterburner system which provides:
 - 1) 81% reduction in the overall emissions of volatile organic material from the coating line, and
 - 2) Oxidation to carbon dioxide and water of 90% of the nonmethane volatile organic material (measured as total combustible carbon) which enters the afterburner.
- bc) A The system used to control such emissions is demonstrated to have control efficiency equivalent to or greater than that provided under the applicable provision of Section 215.204 or subsections (a) or (b) as approved by the Agency.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 215.207 Internal Offsets Compliance by Aggregation of Emission Sources

- a) No person shall cause or allow the emission of volatile organic material from any coating line to exceed any limitation contained in Section 215.204 unless Owners or operators of coating lines subject to Section 215.204 may comply with this Section rather than with Section 215.204. The methods or procedures used to determine emissions of volatile organic material under this Section shall be approved by the Agency. Emissions of volatile organic material from sources subject to Section 215.204 are allowable, notwithstanding the limitations in Section 215.204, if the combined actual emissions rate from all selected coating lines at the coating plant, but not including coating lines or other emission sources constructed or modified after July 1, 1979, is less than or equal to the combined allowable emissions rate as determined by the following equations:

$$E_{ALL} = \sum_{j=1}^m \sum_{i=1}^n (A_i B_i)_j$$

$$E_{ACT} = \sum_{j=1}^m \sum_{i=1}^n (C_i B_i (1 - D_i))_j$$

b) A_i shall be determined by the following formula:

$$A_i = \frac{R_i}{1 - \frac{R_i}{S_i}}$$

bc) As used in subsection (a), symbols mean the following:

E_{ALL} = the allowable emission rate from the coating plant in kilograms per day kg/day (pounds per day lb/day).

A_i = the allowable emission rate limit for each a coating pursuant to Section 215.204 expressed in kg/l (lbs/gal) of coating solids, excluding water, delivered to the coating applicator.

B_i = the volume of each coating solids in l/day (gal/day), excluding water, in a coating as delivered to the coating applicator line.

m = the number of coating lines included in the combined emission rate.

n = the number of types of different coatings delivered to the a coating applicator line.

E_{ACT} = the actual emissions rate from the coating plant in kg/day (lbs/day)

C_i = the weight of volatile organic material per volume of coating solids in kg/l (lb/gal) for each a coating applied.

D_i = the control efficiency by which emissions of volatile organic material from the a coating are reduced through the use of control equipment.

R_i = the applicable emission limit pursuant to Section 215.204, for a coating, in kg/l (lb/gal) of coating, excluding water.

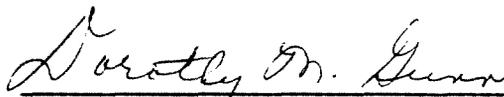
S_i = the density of the volatile organic material in a coating in kg/l (lb/gal).

- ed) The owner or operator of the coating plant shall maintain records of the density of the volatile organic material in each coating, the quantity and solvent volatile organic material and solids content of each coating applied and the line to which ~~it~~ coating is applied, in such a manner so as to assure demonstrate continuing compliance with the combined allowable emissions rate.
- de) Except for emission sources subject to Sections 215.301 or 215.302, credits for offsets from emission sources at the coating plant that are subject to this Part, other than coating lines, may be given, but only to the extent that they represent reductions emissions are reduced from the allowable emission limits for such emission sources contained in either this Part, or any existing operating permit, whichever limit is less.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

IT IS SO ORDERED

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Proposed Rule, First Notice Opinion and Order was adopted on the 16th day of July, 1987, by a vote of 6-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board