

(Draft Board Letter)

BOARD MEETING DATE: May 1, 2009

AGENDA NO.

PROPOSAL: Amend Rule 1171 - Solvent Cleaning Operations and Rule 1122 – Solvent Degreasers

SYNOPSIS: The proposed amendments extend the compliance date for the use of low-VOC solvents for clean-up of lithographic ultraviolet/electron beam ink application equipment and on-press screens in screen printing. The proposal also exempts certain specialized, small usage, low emission applications and provides other clarifying language in Rules 1171 and 1122.

COMMITTEE: Stationary Source, March 20, 2009, Reviewed

RECOMMENDED ACTIONS:

Adopt the attached resolutions:

1. Certifying the CEQA Final Subsequent Environmental Assessment for the proposed amendments.
2. Amending Rule 1171 – Solvent Cleaning Operations and Rule 1122 – Solvent Degreasers

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Background

Rule 1171 – Solvent Cleaning Operations control primarily VOC emissions generated from the use of solvent cleaning materials during production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas. Rule 1122 – Solvent Degreasers control VOC emissions generated from the use of solvents in solvent cleaning machines for removing contaminants from parts, products, tools, machinery, and equipment. Past amendments to these rules have achieved more than 90% VOC emission reductions or about 77 tons per day through greater use of aqueous

cleaning technologies, VOC-exempt solvents, and the development of new low-VOC cleaning materials. However, certain cleaning applications that typically have overall low-usage volumes continue to use high-VOC solvents due to lack of low-VOC alternative cleaners that meet performance criteria.

The February 2008 amendment to Rule 1171 extended the compliance date to January 1, 2009 for the use of 100 grams per liter VOC formulations for clean-up of ultraviolet/electron beam (UV/EB) inks in lithographic printing, and on-press screens and automatic screen reclamation in screen printing operations. The delay was necessary to allow additional time for the printing industry to test new formulations and transition to the new cleaning materials. Since then, the Printing Industries of California (PIC) and the Specialty Graphic Imaging Association (SGIA) have been working closely with printers and solvent formulators in developing and testing a number of low-VOC (100 g/l or less VOC) solvent formulations in actual production environment. Quarterly progress reports have been submitted to the South Coast Air Quality Management District (AQMD) pertaining to the test program.

As of today, the lithographic printing industry has reported little progress in identifying UV/EB formulations that perform well during tests at printing facilities. According to industry representatives, low-VOC solvents showed some initial success but eventually failed to perform adequately in a production environment, primarily due to residue build up over time, resulting in unacceptable print production quality. However, some vendors continue to develop and market low-VOC formulations to UV printers, with varying success in the field. Test efforts at several large printing facilities continue for other potential low-VOC solvents. In addition, the lithographic printing industry is evaluating the use of the impregnated cloth blanket cleaning system for cleaning UV inks.

In screen printing, the SGIA reported no success in finding acceptable low-VOC solvents for cleaning on-press screens. Low-VOC solvents failed performance criteria, resulting in poor quality prints, higher solvent usage, and increased wastes from additional dirty shop towels and make-ready discards. However, successful products in the 300 grams per liter VOC range have been identified for on-press screen cleaning. In addition, the SGIA reported that low-VOC cleaners work well for final screen reclamation activities.

Similar to the printing industry, manufacturers of stereolithography equipment and resins have conducted research work to identify alternative cleaning solvents that would satisfy cleaning requirements. Test results indicate that compliant technology consisting of aqueous, exempt solvents, and other solvent blends fail to meet established performance criteria. As such, Rules 1171 and 1122 provide a limited exemption from the 25 gram per liter VOC limit for clean-up solvents used to remove photocurable

resins from stereolithography equipment and models; however, this exemption ended January 1, 2009.

In December 2008, industry representatives informed AQMD that low-VOC alternative solvents with equal performance characteristics are not available at this time for cleaning UV/EB inks, on-press screens, and stereolithography equipment and models. In addition, industry requested AQMD to further delay implementation of the applicable low-VOC limits in Rules 1171 and 1122 for these solvent cleaning applications. The additional time will allow industry to conduct further tests of compliant cleaning materials, which have been recently introduced into the marketplace and have demonstrated some positive results.

In February 2009, the Board approved enforcement discretion for the applicable VOC limits in Rules 1171 and 1122 for clean-up of UV/EB inks in lithographic printing, on-press screens in screen printing, and photocurable resins from stereolithography equipment and models until such time when amendments to the rules are presented to the Board.

Public Process

During the development of Proposed Amended Rule 1171 and Proposed Amended Rule 1122, staff worked with industry and other persons affected by the proposed amendments. A public workshop was held on February 27, 2009. Comments received during the public workshop, including staff's responses, are summarized in Appendix A.

Proposal

The proposed amendments to Rule 1171 and Rule 1122 extend the compliance date for the use of certain low-VOC clean-up solvents to provide industry with additional time to fully develop and test compliant cleaning materials that meet performance criteria. Staff's proposal also exempts certain specialized, small usage, low emission applications. Finally, the proposed amendments to Rule 1171 and Rule 1122 add clarifying language and remove outdated rule requirements.

Proposed Amendments to Rule 1171

Staff is proposing changes to the rule as follows:

- Extend the 100 grams per liter VOC compliance date for the cleaning of lithographic UV/EB ink application equipment and on-press screens in screen printing operations from January 1, 2009 to January 1, 2010;
- Establish an interim VOC limit of 300 grams per liter for the cleaning of on-press screens until January 1, 2010;

- Extend the exemption for the cleaning of UV/EB lamps and reflectors, metering rollers, dampening rollers, and printing plates in lithographic UV/EB ink application equipment from January 1, 2009 to January 1, 2010 provided that the solvent used for such cleaning does not contain more than 800 grams of VOC per liter;
- Establish an exemption from the 25 grams per liter VOC limit for the cleaning of photocurable resins from stereolithography equipment and models;
- Exempt from the VOC limit the cleaning of application equipment used to apply solvent-based fluoropolymer coatings provided the clean-up solvent used for such cleaning does not contain more than 900 grams of VOC per liter; and
- Add clarifying language and remove outdated rule requirements.

Proposed Amendments to Rule 1122

Staff is proposing changes to the rule as follows:

- Establish an exemption from the 25 grams per liter VOC limit for the cleaning of photocurable resins from stereolithography equipment and models; and
- Add clarifying language and remove outdated rule requirements.

Emission Reductions

Total VOC emissions from the affected solvent cleaning activities in Rule 1171 are estimated to be 0.2 ton per day. The proposal delays estimated emission reductions of 0.14 ton per day for one year.

For stereolithography equipment and models, the estimated VOC emissions from clean-up operations for stereolithography equipment and models in Rule 1171 and Rule 1122 are 1.8 lbs per day. Staff's proposal to exempt such cleaning application in Rule 1171 and Rule 1122 translates to forgone emissions of about 1.7 lbs per day.

In addition, VOC emissions from clean-up of solvent-based fluoropolymer coatings are estimated to be 4 lbs per day. The proposed exemption for this cleaning application will forgo estimated emission reductions of 3.9 lbs per day.

California Environmental Quality Act

The proposed amendments to Rule 1171 and Rule 1122 (hereinafter referred to as "the proposed project") constitute a modification of a previously approved project that was analyzed in a Rule 1171 Final EA and Rule 1122 Final EA that were certified by the Board in October 1999 and September 2001, respectively. Accordingly, the AQMD, as lead agency, has prepared a Draft Subsequent Environmental Assessment (SEA) pursuant to CEQA Guidelines §15162 and §15252 for the proposed project. The delay

in emission reductions from extending the final compliance date and the emission reductions foregone from providing permanent exemptions would exceed the AQMD's daily VOC operational significance threshold, so the air quality impacts have been determined to be significant. No significant adverse impacts were identified for any other environmental topics. The Draft SEA was circulated for a 45-day public review and comment period that ends on April 16, 2009. After the close of the public review period, responses to all comments will be prepared and included in the SEA, at which time the document will become a Final SEA.

Socioeconomic Analysis

Proposed Amended Rule 1171 would delay by one year (until January 1, 2010) the compliance date for the use of solvents with VOC content of 100 grams per liter or less in lithographic printing using UV/EB inks and on-press screen cleaning in screen printing. The cost associated with using the low-VOC solvent would thus be delayed by one year.

PAR 1171 would also extend by a year an existing exemption for clean-up of metering rollers, dampening rollers, printing plates, and UV/EB lamps and reflectors in UV/EB ink application equipment. There is no additional cost resulting from this extension, but it does provide flexibility to the affected printing operations as they gain experience in using products with lower VOC content.

Finally, staff's proposal would add an exemption to Rules 1171 and 1122 for the clean-up of photocurable resins from stereolithography and models, and application equipment used for solvent-based fluoropolymer coatings. Affected facilities are expected to continue using existing cleaning materials with no additional cost.

In conclusion, PAR 1171 and PAR 1122 would not have any cost or adverse socioeconomic impacts.

Comparative Analysis

The proposed amendment to Rule 1122 does not impose a new emission limit or standard, make an existing emission limit or standard more stringent, or impose new or more stringent monitoring, reporting or recordkeeping requirements. Thus, a comparative analysis is not required.

With respect to the proposed amendments to Rule 1171, the only federal requirement applicable to similar sources is the National Emission Standards for Hazardous Air Pollutants (NESHAP) requirement for handwipe cleaning in the aerospace industry. The requirements of Rule 1171, however, do not apply to handwipe cleaning in the aerospace industry; therefore, Rule 1171 is not in conflict with any federal requirement. Additionally, AQMD Rule 1401 - New Source Review of Toxic Air Contaminants and Rule 1402 - Control of Toxic Air Contaminants from Existing Sources, control the

emissions of solvent containing toxic or hazardous air pollutants. Rule 1401 limits emissions from new and modified permitted sources exceeding certain thresholds, and Rule 1402 limits emissions from existing sources.

AQMP and Legal Mandates

The California Health and Safety Code requires the AQMD to adopt an Air Quality Management Plan to meet state and federal ambient air quality standards in the Basin. In addition, the California Health and Safety Code requires that the AQMD adopt rules and regulations that carry out the objectives of the AQMP.

The 1999 amendment of Rule 1171 implemented a control measure from the 1997 AQMP (CM#97ADV-CLNG) to meet state and federal requirements. The proposed changes to Rule 1171 delay part of the VOC emission reductions expected from the 1999 rule amendment; however, this would not affect the overall attainment strategy.

The proposed amendment to Rule 1122 does not have a significant impact on air quality or emission limitations, and, therefore, will not affect the ozone attainment strategy outlined in the AQMP.

Draft Findings

Before adopting, amending, or repealing a rule, the California Health and Safety Code requires the AQMD to adopt written findings of necessity, authority, clarity, consistency, non-duplication, and reference, as defined in Section 40727. The draft findings are as follows:

Necessity – The AQMD Governing Board has determined that a need exists to amend Rule 1171 – Solvent Cleaning Operations and Rule 1122 – Solvent Degreasers, in order to delay the compliance date of low-VOC limits that are infeasible at this time for certain cleaning applications.

Authority – The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from the California Health and Safety Code sections 39002, 40000, 40001, 40440, 40441, 40702, 41508, and 41700.

Clarity – The AQMD Governing Board has determined that the proposed amendments to Rules 1171 and 1122 are written or displayed so that their meaning can be easily understood by persons directly affected by it.

Consistency – The AQMD Governing Board has determined that Proposed Amended Rules 1171 and 1122 are in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

Non-Duplication – The AQMD Governing Board has determined that the proposed amendments to Rules 1171 and 1122 do not impose the same requirements as any

existing state or federal regulations, and the proposed amended rules are necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference – In adopting this regulation, the AQMD Governing Board references the following statutes which the AQMD hereby implements, interprets or makes specific: California Health and Safety Code sections 40001, 40440, and 40702.

Conclusion and Recommendation

Staff agrees that additional time is needed to fully develop compliant cleaning materials to meet the performance requirements for clean-up of UV/EB inks and on-press screens. Further, low-VOC alternative cleaning solvents with equal performance characteristics are not available at this time for stereolithography equipment and models, and application equipment using solvent-borne fluoropolymer coatings. As a result, staff recommends that Rule 1171 and Rule 1122 be amended in order to delay implementation of the 100 grams per liter VOC limit for cleaning UV/EB inks and on-press screens, establish a 300 grams per liter interim limit for clean-up of on-press screens, and exempt stereolithography equipment and models and clean-up of solvent-based fluoropolymer coatings application equipment from the VOC limit.

Implementation and Resources

Current AQMD resources are sufficient to implement the proposed amendments with no additional fiscal impact.

List of Reference Materials

Progress Report on Compliance with Rule 1171, January 2009

Final Staff Report for Proposed Amended Rule 1171, February 2008

Rule 1171 Final Environmental Assessment, October 1999

Rule 1122 Final Environmental Assessment, September 2001

Attachments

A. Rule 1171 Language

B. Rule 1122 Language

APPENDIX A

The following comments were received during the public workshop held on February 27, 2009.

Comment: AQMD should not extend the compliance date in UV/EB ink clean up. Every industry has stepped-up to convert to low-VOC alternative cleaners.

Response: The results of printing industry's test program indicated that most compliant formulations failed to meet performance criteria and that more work is needed to come up with viable cleaning solvents. Printers have also indicated that UV inks are more difficult to clean than conventional inks. Extending the compliance date for the use of low-VOC solvents allows industry additional time for reformulation and testing. Under strict oversight by AQMD, the printing industry is committed to continue its test program and ensure that all known potential compliant formulations are included in the test program.

Comment: Acetone is used successfully for cleaning stereolithography equipment. It is not right for AQMD to exempt this cleaning process, even if emissions are small.

Response: Stereolithography (SL) users have found that acetone is too aggressive for cleaning SL prototypes, particularly for models that use flexible, high-temperature resins. SL prototypes washed in acetone exhibit inaccurate dimensions due to swelling. In addition, cleaning with acetone causes cracking and crazing of the plastic's surface. One company that previously used acetone for stereolithography clean up has switched back to using isopropyl alcohol due to cleaning problems associated with the use of acetone. Tests conducted by manufacturers of stereolithography equipment and resins indicate that other complaint technologies such as aqueous and blends of exempt solvents failed to meet established performance criteria.

Comment: How many compliant products need to be available in the market before AQMD implements the low-VOC limits for clean-up of UV/EB inks?

Response: AQMD does not set any number of compliant products for it to implement VOC limits but rather looks at available technology that meets performance criteria. The delay in compliance date for the use of low-VOC solvents allows the printing industry additional time to develop and test additional formulations that perform well for the entire spectrum of UV/EB applications and substrates.

Comment: There are no known low-VOC replacement solvents for clean up of application equipment using solvent-based fluoropolymer coatings.

Response: Tests of several blends of VOC-exempt solvents indicate that existing compliant solvent formulations do not meet performance criteria for clean-up of certain solvent-based fluoropolymer coatings. An exemption is added in Rule 1171 for this cleaning application.