

ILLINOIS POLLUTION CONTROL BOARD

January 18, 2001

IN THE MATTER OF:)
)
PETITION OF BEMA FILM SYSTEMS, INC.)
FOR AN ADJUSTED STANDARD FROM 35) AS 00-11
ILL. ADM. CODE SECTIONS 218.401(a), (b),) (Adjusted Standard – Air)
and (c))

SUSAN W. HORN OF JOHNSON & BELL, LTD. APPEARED ON BEHALF OF THE PETITIONER; and

BONNIE SAWYER APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by E.Z. Kezelis):

This matter comes before the Board on a petition for adjusted standard filed on March 14, 2000, by BEMA Film Systems, Inc. (BEMA) for its printing facility located in Elmhurst, DuPage County, Illinois. In the petition, BEMA requests that the Board adopt an adjusted standard from 35 Ill. Adm. Code 218.401(a), (b), and (c), which is commonly referred to as the “Flexographic Printing Rule.” The adjusted standard is requested from the portion of the Flexographic Printing Rule which requires flexographic printers use water-based, compliant inks that either contain no more than 40% volatile organic material (VOM) by volume or contain no more than 25% VOM by volume of the volatile content of the ink. Alternatively, the Flexographic Printing Rule also requires that if a printer cannot use the compliant inks, then the printer must design and apply an approved control device to capture VOM emissions.

BEMA seeks an adjusted standard because it allegedly cannot use the water-based compliant inks and because the cost of installing and using an approved control device outweighs the benefit. The Illinois Environmental Protection Agency (Agency) filed its recommendation on October 17, 2000, in which it recommended that the Board grant the adjusted standard with conditions.

The Board’s responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 *et seq.* (1998)). The Board is charged to “determine, define and implement the environmental control standards applicable in the State of Illinois” (415 ILCS 5/5(b) (1998)) and to “grant . . . an adjusted standard for persons who can justify such an adjustment” (415 ILCS 5/28.1(a) (1998)).

A hearing in this matter was held on November 13, 2000, before Board Hearing Officer John Knittle. The parties waived posthearing briefs and no public comments were received. The Board has attempted to expedite its decision in response to BEMA’s motion for

expedited ruling, which was filed on November 30, 2000. The Board finds that BEMA has met the requirements for an adjusted standard from the Flexographic Printing Rule found at 35 Ill. Adm. Code 218.401(a), (b), and (c), and accordingly grants the adjusted standard with the conditions suggested by the Agency.

REGULATORY HISTORY

The regulation from which BEMA seeks an adjusted standard applies to sources with the potential to emit (PTE) 25 TPY or more of VOM. The original reasonably available control technology (RACT) regulations applied to major sources with actual VOM emissions in excess of 100 TPY. However, Section 182(d) of the Clean Air Act (42 USC 7401 *et seq.* (1996)) requires individual states with severe ozone nonattainment areas to include all sources with the PTE at least 25 TPY as major sources and adopt RACT regulations applicable to those sources.¹ As a result of this, the Board adopted a rule that reduced the applicability threshold from 100 TPY to sources with the PTE of 25 TPY or more. See Omnibus Cleanup of the Volatile Organic Material RACT Rules Applicable to Ozone Nonattainment Areas: Amendments to 35 Ill. Adm. Code 203, 211, 218 and 219 (September 9, 1993), R93-9. The RACT control requirements remained unchanged. BEMA is permitted to emit more than 25 TPY and finds that it cannot comply with those control requirements.

The specific regulation from which BEMA seeks an adjusted standard is 35 Ill. Adm. Code 218.401(a), (b), and (c), which was originally adopted by the Board in RACT Deficiencies in the Chicago Area: Amendments to 35 Ill. Adm. Code Part 215 and the addition of Part 218 (July 25, 1991), R91-7, and which provides, in pertinent part, as follows:

- a) No owner or operator of a subject flexographic, packaging rotogravure or publication rotogravure printing line shall apply at any time any coating or ink unless the VOM content does not exceed the limitation specified in either subsection (a)(1) or (a)(2) below. Compliance with this Section must be demonstrated through the applicable coating or ink analysis test methods and procedures specified in Section 218.105(a) of this Part and the recordkeeping and reporting requirements specified in Section 218.404(c) of this Part. As an alternative to compliance with this subsection, a subject printing line may meet the requirements of subsection (b) or (c) below.
 - 1) Forty percent VOM by volume of the coating and ink (minus water and any compounds which are specifically exempted from the definition of VOM), or
 - 2) Twenty-five percent VOM by volume of the volatile content in the coating and ink.

¹ BEMA is located in DuPage County, which along with Cook, Kane, Lake, and Will Counties, Oswego Township in Kendall County, and Aux Sable and Goose Lake Townships in Grundy County, make up the Chicago-area ozone nonattainment area. See 35 Ill. Adm. Code 218.

- b) No owner or operator of a subject flexographic, packaging rotogravure or publication rotogravure printing line shall apply coating or inks on the subject printing line unless the weighted average, by volume, VOM content of all coatings and inks as applied each day on the subject printing line does not exceed the limitation specified in either subsection (a)(1) (as determined by subsection (b)(1) or subsection (a)(2)) (as determined by subsection (b)(2)). Compliance with this subsection must be demonstrated through the applicable coating or ink analysis test methods and procedures specified in Section 218.105(a) of this Part and the recordkeeping and reporting requirements specified in Section 218.404(d) of this Part.

* * *

- c) No owner or operator of a subject flexographic, packaging rotogravure or publication rotogravure printing line equipped with a capture system and control device shall operate the subject printing line unless the owner or operator meets the requirements in subsection (c)(1), (c)(2), or (c)(3) and subsections (c)(4), (c)(5) and (c)(6) below.
- 1) A carbon adsorption system is used which reduces the captured VOM emissions by at least 90 percent by weight, or
 - 2) An incineration system is used which reduces the captured VOM emissions by at least 90 percent by weight, or
 - 3) An alternative VOM emission reduction system is used which is demonstrated to have at least a 90 percent control device efficiency, approved by the Agency and approved by USEPA as a SIP revision, and
 - 4) The printing line is equipped with a capture system and control device that provides an overall reduction in VOM emissions of at least:
 - A) 5 percent where a publication rotogravure printing line is employed, or
 - B) 65 percent where a packaging rotogravure printing line is employed, or
 - C) 60 percent where a flexographic printing line is employed, and
 - 5) The control device is equipped with the applicable monitoring equipment specified in Section 218.105(d)(2) of this Part and

except as provided in Section 218.105(d)(3) of this Part, the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use, and

- 6) The capture system and control device are operated at all times when the subject printing line is in operation. The owner or operator shall demonstrate compliance with this subsection by using the applicable capture system and control device test methods and procedures specified in Section 218.105(c) through Section 218.105(f) of this Part and by complying with the recordkeeping and reporting requirements specified in Section 218.404(e) of this Part. 35 Ill. Adm. Code 218.401.

BACKGROUND

On May 17, 1999, BEMA filed a petition for variance with the Board, seeking a variance from the Flexographic Printing Rule found at 35 Ill. Adm. Code 218.401(a), (b), and (c). As a result of negotiations with the Agency, BEMA then moved to dismiss the variance petition on December 28, 1999. On January 6, 2000, the Board granted the motion to dismiss. The instant petition for adjusted standard was then filed by BEMA on March 14, 2000.²

BEMA operates a flexographic printing facility (facility) located in Elmhurst, DuPage County, Illinois. Pet. at 4. BEMA employs 30 people and operates two central-impession, flexographic printing presses at the facility. *Id.* BEMA's printing process involves printing six-color images on "high-slip" polyethylene surfaces. *Id.* The result is a packaging material that is used by BEMA's customers for the packaging of food and consumer products such as: frozen meats, pasta, breads, vegetables, cookies, candies, pet supplies, grass seed, bird seed, hardware items, aluminum pans, medical items, car batteries, and pillows. Pet. at 4-5. BEMA's customers request the "high-slip" material because it is easier to use with their high speed filling and sealing equipment. Pet. at 5. BEMA describes its business as a small "job-shop," meaning that it contracts for short-term, smaller printing jobs, that range in length from a couple of hours to day long. Pet. at 4; Tr. at 17-18.

BEMA uses inks in the printing process that are formulated with solids, pigments, and solvents. Pet. at 5. The solvents, which contain VOM, are added to the inks in order to produce an ink that runs smoothly through the printing presses and produces the sharpest possible printed image. *Id.* The solvents also allow BEMA to print on the "high-slip" film. *Id.* According to BEMA, the use of water to dilute the inks would not have the same result. *Id.*

² The petition for adjusted standard will be cited as "Pet. at ___." The Agency's response and recommendation will be cited as "Resp. at ___."

BEMA currently has an Agency issued permit, which allows it to emit a maximum of 77.4 tons per year (TPY) of VOM. Pet. at 6. BEMA's actual emissions for 1996, 1997, and 1998, were 30.7 TPY, 29.00 TPY, and 23.00 TPY, respectively. *Id.*

As previously explained, BEMA's printing process involves printing images on "high-slip" polyethylene film. Pet. at 7. BEMA's customers request the "high-slip" film because it is easier for them to manipulate in their own processes. *Id.* BEMA's customers also require the printed images appear on the outside surface of the "high-slip" film. *Id.* According to BEMA, printing on the outside surface of the film, "creates significantly different concerns than printing an image on the reverse side of the substrate [film] or printing with a lamination technique." *Id.* For example, printing the image on the outside surface of the film requires that the printed image be "extremely durable and highly scratch-resistant" so as to avoid damaging the image when it comes into contact with other packages and with varying environmental conditions. Pet. at 8. BEMA's customers require the outer surface printing. *Id.*

"Reverse printing" is a technique in which the printed image is displayed on the inside surface of the packaging. Pet. at 8. However, because many of BEMA's customers use the packaging material for food and other consumer goods, they do not want the packaged goods to come into contact with the inks. *Id.* Therefore, this is not an option for BEMA.

Another printing technique is "lamination" which involves printing an image so that it is bonded between two films. Pet. at 9. Because this technique involves the use of two substrates, or films, there are additional costs associated with it that make the use of this technique cost prohibitive to BEMA's customers. *Id.*

ADJUSTED STANDARD PROCEDURE

In both a general rulemaking and a site-specific rulemaking, the Board is required to take the following factors into consideration: the existing physical conditions, the character of the area involved, including the character of the surrounding land uses, zoning classifications, and the technical feasibility and economic reasonableness of measuring or reducing a particular type of pollution. 415 ILCS 5/27(a) (1998). The general procedures that govern an adjusted standard proceeding are found at Section 28.1 of the Act (415 ILCS 5/28.1 (1998)) and the Board's procedural rules at 35 Ill. Adm. Code 104. Section 28.1 of the Act also requires that the adjusted standard procedure be consistent with Section 27(a).

In determining whether an adjusted standard should be granted from a rule of general applicability, the Board must consider the factors at Section 28.1(c) of the Act (415 ILCS 5/28.1(c) (1998)), and BEMA has the burden of proving that it has satisfied those factors, which are:

- 1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;

- 2) the existence of those factors justifies an adjusted standard;
- 3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
- 4) the adjusted standard is consistent with any applicable federal law. 415 ILCS 5/28.1(c) (1998).

In granting an adjusted standard, the Board also has the authority to impose conditions that may be necessary to accomplish the purposes of the Act. 415 ILCS 5/28.1(a) (1998).

DISCUSSION

For the reasons set forth herein, the Board grants BEMA's request for an adjusted standard from 35 Ill. Adm. Code 218.401(a), (b), and (c). The Board finds that BEMA has met the criteria contained in Section 28.1 of the Act (415 ILCS 5/28.1 (1998)), and is accordingly entitled to the relief it has requested.

Factors Relating to BEMA are Substantially and Significantly Different

BEMA maintains that the factors relating to it are substantially and significantly different than those factors considered by the Board in adopting the rule of general applicability. Pet. at 26. BEMA states that when adopted, the Flexographic Printing Rule considered emissions from large flexographic printing operations that have a greater impact on air quality than the smaller "job shop" printers like BEMA. *Id.* BEMA argues that the costs of compliance with the Flexographic Printing Rule are so high that they are more easily absorbed by large printing operations. Pet. at 27. Due to its size and the type of jobs performed, BEMA's compliance with the Flexographic Printing Rule is neither economically reasonable nor technically feasible. *Id.*

The Agency agrees that the factors applicable to BEMA are substantially and significantly different from those considered by the Board when it adopted these rules. The Agency acknowledges that the cost of add-on control equipment to BEMA is beyond the costs contemplated by the Board in adopting the flexographic printing rules. Resp. at 14. The Agency also agrees that the use of compliant water-based inks is not currently feasible for this particular facility. *Id.*

The Board concludes that the factors relating to BEMA are substantially and significantly different than those considered by the Board when it adopted the flexographic printing rules.

Existence of Different Factors Justifies an Adjusted Standard

BEMA asserts that it has investigated a number of compliance options. First, it explains why the use of compliant water-based inks will not work for its operations. One problem is that the currently available water-based inks clog the ink rollers and dry to the consistency of concrete. Pet. at 9. In order to combat these problems, BEMA would have to institute time consuming and costly maintenance measures at the end of every short job that is run. *Id.* Additionally, the age of BEMA's printers (30 years) means that they were not designed for use with water-based inks and mechanical components in the printers may actually corrode and become damaged if put into contact with water. *Id.* BEMA estimates that it could retrofit the printers with water-resistant moving parts at a cost of \$100,000 per press. Pet. at 10. Finally, the compliant water-based inks take much longer to dry on the film than the solvent-based inks. *Id.* The solvent-based inks set the image permanently in less than 0.6 seconds, whereas the water-based inks take sometimes hours longer to dry. *Id.* Because of these problems, BEMA is unable to utilize the water-based inks and satisfy its customers. Pet. at 11.

BEMA also investigated the possibility of installing "add-on" technologies and found that three technologies were potentially available to its flexographic printing processes: (1) carbon adsorption technology; (2) wet scrubber technology; and (3) catalytic or thermal oxidation (afterburner) technology. Pet. at 16. After examining each of these three options, BEMA determined that none of them could reasonably be utilized at its facility for the reduction of VOM emissions.

Carbon adsorption is not feasible because, due to the high vapor pressure of the flexographic ink solvents, efficient adsorption into the carbon beds is precluded. Pet. at 16. Additionally, some of the chemicals in the ink solvent (such as alcohol and acetates) cannot be efficiently removed by the carbon adsorption process. *Id.* The wet scrubbers, likewise, do not effectively remove VOM emissions due to the high vapor pressures of the solvent-based inks. Pet. at 17.

While the catalytic or thermal oxidation technology is adaptable to a process such as BEMA's, this technology is prohibitively expensive, and is therefore, not economically reasonable for this type of operation. Pet. at 17.

The Agency also indicates that it too has been investigating a number of different compliance options that may be available to BEMA. Resp. at 8. The Agency agrees with BEMA's assertion that compliance with the rule of general applicability for BEMA is not economically reasonable or technically feasible. Resp. at 14. The Agency therefore agrees that the existence of different factors involving BEMA's particular business justifies the requested adjusted standard.

Adjusted Standard Will Not Result in Environmental or Health Effects Substantially and Significantly More Adverse

BEMA operates a small print shop. Currently, BEMA is operating under an Agency issued permit that allows it to emit up to 77.4 TPY. Although no information was submitted

with regard to emissions from 1999 or 2000, the annual emissions from 1996 through 1998 were far below the 77.4 TPY maximum. There are no schools or residential areas located in close proximity to the facility. Pet. at 6.

Adjusted Standard is Consistent with Federal Law

BEMA maintains that the granting of this adjusted standard would not violate any federal laws. Pet. at 25. The Clean Air Act and Illinois regulations require that BEMA comply with RACT. *Id.* The Board is empowered to determine what RACT is. *Id.* Accordingly, BEMA argues that the Board has the authority to grant the adjusted standard by finding that the terms of the adjusted standard are RACT for BEMA, thereby satisfying the federal requirements. *Id.* If granted, the adjusted standard would be included by the Agency as a rule specific to BEMA in the State Implementation Plan for Illinois.

AGENCY RECOMMENDED CONDITIONS

In its response to the petition for adjusted standard, the Agency recommends the Board grant the requested adjusted standard with specific conditions. Resp. at 18. BEMA has agreed to each of the conditions recommended by the Agency. Tr. at 15. The conditions fall into three basic categories: recordkeeping, emissions impacts, and Emissions Reduction Market System (ERMS), and are specified more fully in the “order” which begins below at page 9. Resp. at 15-17

In its response and recommendation, the Agency also explained that it has, in conjunction with BEMA and others, conducted its own investigation into technically feasible and economically reasonable means of complying with the Flexographic Printing Rule. Resp. at 8-14. For example, the Agency stated that it has been working with flexographic printers on environmental compliance issues since early 1994. Resp. at 8. Through the Agency’s own investigations, they have found that the industry appears to be “going backwards rather than forwards for this type of printing.” Resp. at 9. The Agency refers to a fact sheet published by the Printers’ National Environmental Assistance Center which describes the use of water-based inks on film as being “similar to placing water on a newly waxed car: The water beads up and slides around the surface.” *Id.*

The Agency also acknowledges the “harsh conditions” that must be endured by the plastic packaging products produced by BEMA. Resp. at 11.

For example, some bags are to be used in freezers, and thus the ink cannot crack or chip under cold conditions. Others must withstand hot conditions or exposure to water, etc. Even under these conditions, the image printed on the substrate cannot crack, scratch, or smear. The image left by a solvent-based ink is more pliable, flexible, and durable. Water-based inks have been found to produce images that crack more readily than solvent-based ink images when applied to flexible surfaces because the image is more crystalline and brittle. *Id.*

The Agency concludes that the Board should grant BEMA the adjusted standard it has requested. Resp. at 14. The Agency agrees that the use of compliant inks is problematic for BEMA and that the cost of add-on equipment is beyond the cost of compliance originally contemplated by the Board in adopting the Flexographic Printing Rule. *Id.*

CONCLUSION

The Board finds that BEMA has provided sufficient justification for the proposed adjusted standard. Accordingly, the Board grants BEMA the requested adjusted standard with the conditions suggested by the Agency.

ORDER

The Board hereby adopts the following adjusted standard, pursuant to the authority of Section 28.1 of the Environmental Protection Act (415 ILCS 5/28.1 (1998)).

1. This adjusted standard applies only to BEMA Film Systems, Inc.'s (BEMA) two existing central impression presses and only to the extent that the presses are being used for printing on plastic, such as polypropylene, polyester, cellophane and polyethylene ("high-slip"), and does not apply to any printing operations on other substrates.
2. BEMA may apply any coating or ink with volatile organic material (VOM) content less than or equal to eighty-two (82%) percent by weight of the coating and ink (minus water and any compounds that are specifically exempted from the definition of VOM) on a monthly-weighted average basis. Compliance with this limitation must be demonstrated through the applicable coating and ink analysis test methods and procedures specified in 35 Ill. Adm. Code 218.105(a) and the recordkeeping requirements specified in condition (4) below.
3. For purposes of establishing an Emissions Reduction Marketing System (ERMS) baseline for BEMA, its actual emissions from the appropriate baseline seasonal allotment period will be adjusted downward to reflect usage of coatings and inks containing no more than seventy-two percent (72%) VOM by weight of the coatings and inks (minus water and any compounds that are specifically exempted from the definition of VOM) applied.
4. BEMA shall collect and record the following information each day for the printing presses subject to this adjusted standard and maintain such information at BEMA's Elmhurst printing facility for a period of five years:
 - A) The name and identification number of each coating and ink applied;

- B) The VOM content and the weight of each coating and ink applied;
- C) The monthly-weighted average VOM content of all coating and inks applied.

Any record showing violation of this adjusted standard shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of this violation.

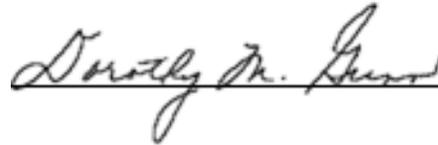
5. BEMA must perform (alone or in conjunction with others) three experiments each year, including any experiments requested by the Agency, of alternative inks to determine if these inks are compliant with the Flexographic Printing Rule and technically feasible for BEMA's printing operations. In addition BEMA will experiment with substrates as suggested by the Agency. Forty-five days following each experiment conducted pursuant to this provision, BEMA shall report its findings and supporting documentation to the Agency;
6. BEMA shall continue to investigate alternative control technologies, including any technologies suggested by the Agency. BEMA shall report the results of those investigations to the Agency within forty-five days; ink applied;
7. Each year, in conjunction with submittal of its annual Clean Air Act Permitting Program (CAAPP) compliance certification or its annual emissions report, if a CAAPP compliance certification is not required, BEMA shall submit a report to the Agency describing the investigations of compliant inks and coatings, different substrates, and add-on control technologies it has undertaken in the previous calendar year and the results of these investigations;
8. BEMA shall not operate any other printing press at its Elmhurst, Illinois, facility without full compliance with the requirements of the Flexographic Printing Rule (35 Ill. Adm. Code 218.401(a), (b), (c));
9. This adjusted standard must be revised or withdrawn if BEMA no longer prints the majority of its images on "high-slip" substrates, or on the outside surface of the "high-slip" substrate;
10. This adjusted standard must be revised or withdrawn if BEMA determines that any add-on control system is economically reasonable and technically feasible or if BEMA uses any add-on control system that controls VOM emissions;
11. This adjusted standard must be revised if it becomes feasible for BEMA to use compliant inks and coatings for the majority of its printing operations;
12. This adjusted standard must be withdrawn if it becomes feasible for BEMA to use compliant inks and coatings for all of its printing operations; and

13. If this adjusted standard is revised or withdrawn and BEMA is a participating source in the ERMS program, BEMA's ERMS baseline will be adjusted downward to the extent that the new or revised requirements for the two central impression presses subject to this adjusted standard would result in lower baseline emissions. If such an adjustment to BEMA's ERMS baseline is required by this provision, the seasonal allotment period used in its original baseline determination shall be used to determine its adjusted baseline. BEMA must submit a CAAPP application for revised baseline, as required by this provision, within 60 days of final withdrawal of, or revision to this adjusted standard.

IT IS SO ORDERED.

Section 41 of the Environmental Protection Act (415 ILCS 5/41 (1998)) provides for the appeal of final Board orders to the Illinois Appellate Court within 35 days of the date of service of this order. Illinois Supreme Court Rule 335 establishes such filing requirements. See 172 Ill. 2d R. 335; see also 35 Ill. Adm. Code 101.520, Motions for Reconsideration.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 18th day of January 2001 by a vote of 7-0.

A handwritten signature in cursive script, reading "Dorothy M. Gunn", written in black ink on a white background.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board