

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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IN THE MATTER OF:

Petition of Formel Industries, Inc.
for an Adjusted Standard from 35
Ill. Adm. Code Sections 218.401(a), (b) and
(c) (the "Flexographic Printing Rule")

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) AS 00- 13
) (Adjusted Standard)
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)

STATE OF ILLINOIS
Pollution Control Board

Notice of Filing

To: Bonnie Sawyer
IEPA - Division of Legal Counsel
Bureau of Air
1021 North Grand Avenue East
Springfield, Illinois 62794

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the PETITION FOR AN ADJUSTED STANDARD of Formel Industries, Inc., a copy of which is herewith served upon you.

Susan W. Horn
Susan W. Horn, Attorney

Date: March 14, 2000

William J. Anaya
Susan W. Horn
Johnson & Bell, Ltd.
222 No. LaSalle St., Suite 2200
Chicago, Illinois 60601
312/372-0770

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Petition For An Adjusted Standard, by Federal Express, upon the following person:

Bonnie Sawyer
IEPA - Division of Legal Counsel
Bureau of Air
1021 North Grand Ave., East
Springfield, IL 62794

Susan W. Horn
Susan W. Horn, Attorney

Date: March 14, 2000

Specifically, the reasonably available control technology ("RACT") adopted by the Board in the Flexographic Printing Rule must be modified as an adjusted standard for FORMEL. Therefore, on December 28, 1999, FORMEL filed a motion to dismiss its petition for variance. On January 6, 2000, the Board granted FORMEL's motion to dismiss the variance petition. FORMEL now files this petition for an adjusted standard.

II. 35 ILL. ADM. CODE SECTION 106.705

A. • Standard From Which Relief Is Sought (Section 106.705(a))

FORMEL requests that the Board grant FORMEL an adjusted standard from the Flexographic Printing Rule at 35 Ill. Adm. Code Subpart H, Sections 218.401 (a), (b) and (c), as that rule applies to the emissions of VOM from FORMEL's operations in Franklin Park, Cook County, Illinois. The specific regulation from which FORMEL seeks an adjusted standard requires that flexographic printers use compliant, water-based inks ("water-based inks") that contain either: (1) no more than 40% VOM (excluding water) by volume; or (2) no more than 25% VOM by volume of the volatile content of the ink. See 35 Ill. Adm. Code Subpart H, Section 218.401. In the alternative, if a source cannot use water-based inks, then the source must design and apply an approved control device. See 35 Ill. Adm. Code Subpart H, Sections 218.401(a), (b) and (c).

If a source chooses to comply with the Flexographic Printing Rule by equipping the flexographic printing process with an add-on control device, then that control device must reduce the captured VOM emissions by at least 90% by weight (for approved carbon adsorption or incinerators systems) or achieve an overall reduction of 60% in VOM emissions by "alternative" control systems that have been approved by the IEPA and the United States Environmental Protection Agency ("USEPA"). See 35 Ill. Adm. Code Subpart H, Sections 218.401(c).

As will be demonstrated herein, FORMEL cannot use water-based inks, and the approved control technologies will work only at unreasonable costs, and, as such, are not RACT for FORMEL.

B. Nature of Regulation of General Applicability (Section 106.705(b))

The regulation from which FORMEL requests an adjusted standard applies to sources with a potential to emit ("PTE") 25 tons per year ("TPY") or more of VOM. The initial RACT regulations applied to major sources with actual VOM emissions in excess of 100 TPY. In response to the adoption of the Federal Implementation Plan, the Board amended the RACT rules to require that all Chicago-area sources with maximum theoretical emissions ("MTE") of at least 100 TPY must implement RACT. Pursuant to Section 182(d) of the Clean Air Act, as amended in 1990, 42 U.S.C. § 7401 *et seq.* ("CAA"), individual states with severe ozone nonattainment areas are required to include all sources with PTE of at least 25 TPY as major sources, and those states must also adopt RACT regulations applicable to those sources. Section 182(d) of the CAA required the implementation of RACT for those sources as expeditiously as possible, but in no event later than May 1, 1995. As mandated by the CAA, the Board established the requirements described in the Flexographic Printing Rule.

The Chicago-area severe ozone nonattainment area includes sources located in Cook, DuPage, Kane, Lake and Will Counties, Oswego Township in Kendall County, and Aux Sable and Goose Lake Townships in Grundy County. FORMEL is located in Cook County which is part of the Chicago-area designated severe ozone nonattainment area.

C. Level of Justification (Section 106.705(c))

The regulation of general applicability from which FORMEL seeks an adjusted standard does not specify a level of justification for an adjusted standard.

D. Facility and Process Description (Section 106.705(d))

1. General Information

FORMEL is an Illinois corporation located in Franklin Park, Cook County, Illinois. FORMEL employs 20-25 people and operates its presses in a 12,500 square foot building. FORMEL uses three central-impession, flexographic printing presses to print images (using inks) onto "high slip" polypropylene, polyester and cellophane film. In the flexographic printing industry, FORMEL is known as a small "job shop" – that is, FORMEL contracts for short-term, smaller printing jobs in the industry, and, as such, FORMEL sets up and tears down its presses for each job. Sometimes, FORMEL switches between these short-term, smaller jobs several times each day.

FORMEL's presses are approximately 30-35 years old. Each press has five separate color drying sections that operate immediately after the application of one of the six colors involved with the image. In addition, each press has a final tunnel dryer. Heated air is currently used to cure the ink (and set the image) at each stage. The three central-impession presses each exhaust 4700 scfm of air.

FORMEL prints a high-quality, six-color image on "high-slip" polypropylene, polyester and cellophane film pursuant to FORMEL's customers' directions and exacting specifications. After an image is printed onto the film, the film is then used as a flexible package or wrapping for food products for human consumption, such as pasta, candy and snack food items. Attached hereto at Exhibit "A" are representative samples thereof.

FORMEL uses inks that are formulated with solids, pigments and solvents. The solvents used in the inks contain VOM. As will be discussed herein, solvents are also added to the inks to dilute the inks so that the viscosity and flow characteristics of the inks provide the sharpest

possible image. The dilution solvents also contain VOM. The use of VOM-containing solvents, rather than water, allows the presses to run at reasonable speeds while producing an acceptable printed image.

Solvents, rather than water, adjust the viscosity of the inks and control color (and the intensity of the color), thereby affecting the quality of the printed images. Most importantly, however, the solvents allow FORMEL to print the images on "high-slip" film. As will be discussed, the currently-available, water-based inks do not allow FORMEL to print satisfactory images on "high-slip" film.

2. FORMEL's Current Permit Conditions

FORMEL has applied for a Clean Air Act permit with the IEPA. FORMEL currently has an upper limit for its VOM emissions of 78 tons per year (TPY) of VOM in accordance with its state permit. FORMEL has reported annual emissions of VOM in 1998 at 67.299 TPY; in 1997 at 61.276 TPY; and in 1996 at 44.30 TPY. Also, in 1994-1995, FORMEL's VOM emissions averaged 56.7 TPY. In the absence of the relief requested by this petition, the RACT requirements of the Flexographic Printing Rule would apply to FORMEL as a source with the potential to emit VOM in excess of 25 tons per year, but with maximum theoretical emissions of less than 100 tons per year.

3. General Description of the Local Non-Attainment Area

FORMEL is located in an industrial area in Franklin Park, Illinois on 25th Avenue, approximately one-quarter mile south of Grand Avenue. There are no schools or residential buildings in the area. Franklin Park, Cook County, Illinois is located in the Metropolitan Chicago Interstate Air Quality Control Region (the "Chicago AQCR") as defined by USEPA

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pursuant to Section 107 of the Clean Air Act. USEPA has designated the Chicago AQCR as currently failing to attain the National Ambient Air Quality Standards ("NAAQS") for ozone.

4. Nature of Distinctions with other Flexographic Printers

FORMEL's major competitors are other small "job shops, and large, full-scale, industrial printers with national and international operations and clients. The large national and international flexographic printers are able to comply with the Flexographic Printing Rule by adding control devices and/or retrofitting their existing presses to use water-based inks for those jobs that have no need for "high-slip" films, which can accept some lesser quality standard, or that can use "no-slip" film. These large national and international printers have been able to absorb the costs associated with compliance because of their large size and market share in the industry. As will be developed herein, the Flexographic Printing Rule is not RACT for FORMEL, however, because FORMEL cannot use water-based inks to produce a quality image on "high-slip" packaging film (also known as a "substrate") and because the costs of control are unreasonable. In short, the only method currently available to FORMEL to provide the crisp, professional images on "high-slip" film is to use solvent-based inks. Strict compliance with the Flexographic Printing Rule would dictate that FORMEL must abandon its customers, leave Illinois or incur an unreasonable cost for control.

5. Flexographic Printing using outside "surface printing"

FORMEL's customers require that printed images appear on the outside surface of the flexible, "high-slip" polypropylene, polyester and cellophane film. Printing on the outside surface of "high-slip" film creates significantly different concerns than printing an image on the reverse side of the substrate or printing with a lamination technique. In the flexographic, surface printing process, ink is transferred from the ink pan to an "imaging roller" by an Analox® roller.

In outside surface printing, the "imaging roller" then transfers the ink to the outside surface of a polypropylene, polyester and cellophane substrate. In reverse flexographic printing, a reverse image is transferred the same way, but to the inside of the substrate. The lamination technique traps the image between two substrates.

When the image is placed on the outside of a package, the image must be sturdier because the outside of a package is subject to contact and friction from other packages and other environmental conditions (heat, cold, moisture) that may scratch, smear, or otherwise adversely affect the image. According to the specifications provided by FORMEL's customers, images must not scratch or smear. Indeed, the printed lines must be crisp and sharp especially when printing images of food or images of the customer's consumer products or when printing the operating or warning instructions for use of the product. Surface printing is mandated by FORMEL's customers, and neither lamination nor reverse printing will suffice because of price.

6. Flexographic printing using the "reverse printing" technique

Because the image is printed on the inside of a substrate, reverse printing has the advantage of keeping the image away from outside materials that may come into contact with, and distort, scratch or smear the image. However, because the image is printed on the inside of a package, the image comes into contact with the customer's product. Because the packages contain food products, FORMEL's customers will not allow the printed image and inks to come into contact with the packaged product.

7. Flexographic printing using the "lamination" technique

In lamination, the printing process is similar to reverse and surface printing. However, lamination involves leaving an image between a "sandwich" of two substrates. Because the image is inside of two pieces of film, this technique preserves the image from inside and outside

friction. However, the costs associated with using twice the packaging materials are significantly greater than that of printing an image on the outside surface. Rather than pay for and accept laminations or reverse printing, FORMEL's customers will simply go elsewhere. Therefore, lamination is not a competitive alternative for FORMEL.

8. Flexographic printing using water-based inks

In order to attain the extraordinary, high-quality results demanded by FORMEL's customers and the consuming public, FORMEL currently has no real choice but to use inks that contain VOM-containing solvents.

In the final analysis, it is unreasonable to require FORMEL to scrap its existing presses and invest in new presses that use currently-available, water-based inks. Those extraordinary costs would force FORMEL out of business, or, at least, out of the State of Illinois. As a practical matter, no "job shop," flexographic printer contracting for smaller, short-term printing jobs using "high-slip" substrates with 30-35 year old presses for surface printing for packaging food products can comply with the Flexographic Printing Rule with the currently-available, water-based inks, so long as the food products industries continue to require clear images and so long as those industries have alternative foreign and domestic sources for those packaging materials.

9. Flexographic printing using solvent-based inks

The most common, currently-available, commercial flexographic inks used in printing images on the outside surfaces of "high-slip" film contain approximately 60% solvent by volume. In addition, these inks are occasionally diluted with additional solvent in order to achieve the proper viscosity for rapid and economical printing. FORMEL uses ethanol and ethyl

acetate as dilution solvents. None of FORMEL's emissions are identified as Hazardous Air Pollutants (HAPs) under Title III of the Clean Air Act Amendments of 1990.

The solvents found in the currently-available, solvent-based inks, and those added for dilution, contain VOM as that material is defined in the Clean Air Act. During the printing and curing processes, the solvents, by their volatile nature, quickly "flash off" the film, thereby permanently setting the image without smearing or distortion. After the "flash off," the solvent gases are directed out of the plant through the roof. Thereafter, the ink waste and solvent waste is collected from the presses, placed in drums, and properly disposed of off-site by a licensed disposal firm.

10. FORMEL uses the mass balance technique to calculate the volume of VOM actually emitted during the process. The emissions are calculated monthly as follows:

Content of VOM in the inks purchased, plus pounds of solvents purchased, less VOM in waste ink removed from the plant and properly disposed of off-site.

11. In 1998, while using solvent-based inks, FORMEL reported 67.299 tons of VOM had been emitted; in 1997, 61.276 tons; and in 1996, 44.3 tons of VOM had been emitted from its presses.

E. Cost of Compliance and Compliance Alternatives (Section 106.705(e)).

1. Water-based inks

The currently-available, water-based inks do not cure on the substrate within an acceptable time, and the images that are left from water-based inks do not adequately cure or adhere to the "high-slip" surfaces as well as the images produced by solvent-based inks. Under the circumstances, water-based inks create images that scratch and smear and therefore are unacceptable to FORMEL's customers. It is well known in the industry that the images from the currently-available, water-based inks provide poorer quality -- less glossy, with less intensity.

The poor quality associated with water-based inks is due to some fairly simple facts. A printed image consists of pigment and a chemically-produced protective film that both protects the pigment and encapsulates the image on the substrate. The protective film produced with solvent-based inks sets the image with the volatilization of the carrier solvent. In other words, when the solvent is "flushed off," the solvent-produced protective film layer remains behind. On the other hand, the protective film produced by water-based inks is catalytic, and as the water slowly evaporates, the protective film layer is produced by a chemical reaction involving constituents of the ink over a much slower, undetermined period of time.

The nature of the two types of chemically-generated protective films are fundamentally different. The chemical protective film layer left by a solvent-based ink is pliable, flexible and durable. The chemical protective film layer left by currently available, water-based inks is crystalline, more brittle and prone to cracking. FORMEL's customers require flexible packages with flexible images that can only be produced with solvent-based inks.

In an effort to comply with the Flexographic Printing Rule, FORMEL and other flexographic printers have attempted to use water-based inks. FORMEL and other flexographic printers have performed various experiments using water-based inks and have reported their findings to the IEPA. FORMEL's experiments have shown that the currently-available, water-based inks are unsuitable to FORMEL because:

- a. The currently-available, water-based inks contain solids that clog the microscopic pores of the Analox® rollers and dry to a consistency of concrete. This requires FORMEL to apply extraordinary and time-consuming maintenance and cleanup care at the end of each job. In the short term, the cleanup time is significantly increased. In the long term, the water-based inks

- cause increased, expensive maintenance and replacement of the Analox® rollers due to the solids that cure inside the microscopic recesses of the roller;
- b. Water-based inks will not adhere as well as solvent-based inks to certain types of materials used by FORMEL such as polypropylene, polyester and cellophane;
 - c. Variable factors beyond the control of FORMEL, such as humidity, temperature and weather conditions, influence the cure time of water-based inks;
 - d. The color of water-based inks is inconsistent between batches of ink;
 - e. The colors of water-based inks are not clear enough for FORMEL's customers;
 - f. Water-based inks are not heat-resistant enough;
 - g. Water-based inks do not run fast enough;
 - h. FORMEL also noted that disposal costs for the currently-available, water-based ink is more than three times the cost for an equivalent volume of solvent-based inks. Solvents have a Btu value, and disposal contractors are available to dispose of those materials for use as fuel in industrial boilers. Wastes from water-based inks have no Btu value, nor any use as an industrial fuel, and must be disposed in a landfill at a much higher disposal cost;
 - i. Water-based inks cannot be color-adjusted on the press;
 - j. The color of the ink can change from one use to the next use; and
 - k. Certain colors look faded and are therefore not rich enough to meet certain customer's specifications.

After several fair and reasonable attempts to use the currently-available, water-based inks, FORMEL has concluded that the use of water-based inks is impractical, unreasonably costly and unsatisfactory to FORMEL's customers. Even in those limited instances where the characteristics of a job and the quality demands of the customer permit the use of water-based inks, the clean-up problems associated with the water-based inks make even occasional use an unreasonable hardship.

FORMEL is a small printer by industry standards, and FORMEL depends on its ability to quickly switch from one printing job to another in order to remain in business. If FORMEL is forced to use the currently-available, water-based inks, then the downtime for cleanup between jobs will be increased, placing FORMEL at a competitive disadvantage. The increased time and expense associated with changing and operating a press with currently-available, water-based inks seriously threatens FORMEL's viability.

2. Three add-on technologies are potentially available to control VOM emissions from flexographic printing presses:

- (1) carbon adsorption technology;
- (2) wet scrubber technology; and
- (3) catalytic or thermal oxidation (afterburner) technology.

Carbon adsorption is not conducive to controlling VOM emissions from the flexographic printing process. The vapor pressure of flexographic ink solvents - the source of VOM emissions in this process - is high, and prevents efficient adsorption onto carbon beds. Further, the oxygenated solvents such as alcohol and acetates cannot be efficiently removed by carbon beds. Therefore, carbon adsorption technology cannot reasonably be applied to control the presses at FORMEL's operation.

Wet scrubber technology is also inappropriate for the flexographic process because flexographic ink solvents have high vapor pressures and wet scrubbers cannot effectively remove them. Wet scrubbers do not achieve an acceptable removal efficiency of flexographic ink solvents. Therefore, wet scrubber technology cannot reasonably be applied to control the presses at FORMEL's operation.

Catalytic or thermal oxidation technology is adaptable to FORMEL's flexographic printing process. However, both catalytic and thermal oxidation are prohibitively expensive and are therefore not RACT for FORMEL. See Report of Air Solutions, Inc. at Exhibit "B" attached hereto.

Also, in order to effectively use the afterburner to achieve the required reductions in VOM emissions, FORMEL must design and build an additional (otherwise non-functional) structure to capture the VOM. As indicated above, FORMEL's presses are very old, and they were not designed with control devices in mind. In order to capture enough VOM to apply the currently-available afterburner technology, a structure needs to be designed, built and installed to permanently enclose all of the presses and control the fugitive emissions from the presses. This structure, however, presents its own set of technical problems, in addition to the unreasonable costs associated with it.

Because of the relatively open design of these older presses, a local (or hood capture system) can not capture enough VOM-containing air without incurring excessive costs. Also, insurance and safety considerations preclude FORMEL from using a permanent total enclosure in such a way. Also, the extreme volatility of the solvents used (particularly during warm weather), with the speed of the presses and the relatively large amount of exposed substrate surface during printing, create safety concerns with VOM in such an enclosed structure. Under

the circumstances, the enclosure increases the potential for a fire or an explosion. However, because of the same volatility, local capture without total enclosure is difficult, if not impossible. In addition, if this control technology were used, FORMEL would be required to air-condition the entire plant for its employees at an additional, extraordinary cost for FORMEL.

Also, as previously noted, the presses used at FORMEL are older units that have relatively short dryer sections between print stations. The age of the presses and the small amount of room available at the plant make it impossible to ensure that existing dryers can (or could) be altered to meet the VOM capture efficiency required. The costs to attempt such alterations are estimated by FORMEL to be in excess of \$100,000 and such alterations cannot be guaranteed to meet the standard.

Also, if local capture were used in lieu of a permanent total enclosure, FORMEL would be required to test for VOM capture efficiency using a temporary total enclosure or using a liquid/gas protocol according to the Data Quality Objective (DQO) approach. The cost of either approach has been estimated at \$40,000/per test/per press. Because there is no guarantee that an individual upgrade of a capture system could meet VOM capture requirements, VOM capture tests would need to be repeated a number of times. Accordingly, the combination of emissions tests costs and local capture improvement costs could easily exceed \$200,000 per press. And, a temporary total enclosure will cost as much as a permanent total enclosure, and will periodically create the same volatility risks and concerns as the permanent total enclosure.

In addition to the cost of a control device, there are other operating considerations that prohibit FORMEL from installing and operating a capture system that would achieve the 60% overall control required by the Flexographic Printing Rule. Due to the fire and explosion concerns involved in concentrating VOM in a confined space for capture, the local Fire

Department will not favor a totally enclosed printing press area. Rather, the Fire Department will require the construction of a fire-safe, masonry wall to enclose the area in order to adequately protect FORMEL's employees. The Fire Department will also require an adequate exit in the event that the control equipment causes or embellishes a fire at the site.

In addition, even if a permanent total enclosure could be installed, FORMEL has concluded that FORMEL's plant would have to exhaust (and therefore control) an extremely significant volume of room air to maintain ambient solvent levels in the workplace at or below 50% of applicable Occupational Safety and Health Act (OSHA) limits. Under these circumstances, if a permanent total enclosure were used, FORMEL could only effectively operate its presses *if the entire building were used as a permanent total enclosure*. An individual permanent total enclosure (built around each press) would not allow FORMEL to operate its business. As a "job-shop," FORMEL requires frequent access to its presses - as often as six times per day - in order to change rollers, reconfigure presses and change inking systems. None of these operations could effectively be carried out within permanent enclosures around each press. Further, the small size of the building and the already small aisles in the building to maneuver products and raw materials leaves no room to erect individual, permanent, total enclosures at each press in any event.

Accordingly, the only practical means of constructing a permanent total enclosure is to utilize the entire shop as a permanent total enclosure. In that case, in order to avoid the threat of explosion, the captured air would need to be mixed with other fresh air to dilute the VOM concentrations from exceeding explosive levels. Then, in order to destroy the VOM an auxiliary fuel (*i.e.*, natural gas) will be used to heat the air to achieve the high temperatures necessary to oxidize the VOM. That is, the VOM-captured air will need to be *diluted* to avoid

the threat of explosion, and then *heated* with another fuel to achieve destruction. The natural gas (or other alternative fuel) expense will add to the already unreasonable (beyond RACT) requirements involving add-on control.

Finally, assuming that the air stream could be thermally destroyed at an overall destruction efficiency of 90%, FORMEL would be required to purchase, install (including ductwork) and operate an incinerator for an annual cost of \$349,412, resulting in a cost per ton of VOM destroyed of approximately \$10,911. See ASI Report attached hereto as Exhibit "B". This solution is economically unreasonable for presses that add only a negligible amount of VOM to the air shed.

FORMEL has seriously considered using add-on controls to reduce emissions both from the facility in general, and more specifically, from individual presses. FORMEL has also considered other control technologies including bio-filtration (a relatively new possibility). Regrettably, the only control technique that is proven to reduce emissions of VOM is thermal oxidation.

All of the costs associated with control have been summarized using USEPA Control Cost Spreadsheets, attached to ASI report at Exhibit "B". The annual minimal control costs for FORMEL would be \$10,911 per ton of VOM. This is an excessive cost - beyond the Reasonably Available Control Technology standard otherwise mandated by the Clean Air Act.

2. The Rule As Applied To FORMEL Is Unreasonable

Since 1949, FORMEL has operated and upgraded its presses to keep up with the changing needs of its customers. However, for all of the foregoing reasons, retrofitting the existing presses in order to come into full compliance with the Flexographic Printing Rule would be unreasonably expensive and burdensome due to the age of the existing presses.

F. Proposed Adjusted Standard (Section 106.705(f))

FORMEL proposes the following adjusted standard for adoption by the Board:

FORMEL may continue to operate its flexographic printing operation without control and without using water-based inks, so long as:

1. FORMEL's total, actual VOC emissions are less than 100 TPY;
2. FORMEL continues to print its images on "high-slip" substrates;
3. FORMEL continues to print its images on the outside surface of "high slip" substrates;
4. FORMEL performs (alone or in conjunction with others) various experiments each year (as directed by the IEPA) with alternative inks, to determine if any alternative inks are compliant and compatible with FORMEL's flexographic printing needs. In addition, FORMEL shall experiment with substrates as suggested by the IEPA from time to time. Following each such experiment, FORMEL shall report its findings to the IEPA ;
5. FORMEL shall continue to investigate alternative control technologies, as suggested by the IEPA from time to time, and to report the results of those investigations to the IEPA;
6. FORMEL shall not operate any other press at its Franklin Park, Cook County, Illinois site without full compliance with the Clean Air Act;
7. FORMEL shall continue to report all annual emissions to the IEPA; and
8. FORMEL, if necessary, will file an application as a participating source in the ERMS Reduction Program within 90 days after the Board grants FORMEL's petition for an adjusted standard. For purposes of determining the baseline ATUs for

FORMEL, the compliance level should be based on the adjusted standard and not the Flexographic Printing Rule.

G. The Quantitative and Qualitative Impact of FORMEL's Activity (Section 106.705(g))

As indicated in this petition, because FORMEL is a small, job shop, flexographic printer, its overall effect on the air shed is insignificant. Nonetheless, FORMEL recognizes that many small businesses can make that claim in light of the mandates imposed by the Clean Air Act. More importantly, however, in analyzing FORMEL's impact, the Board must consider the difference between volume of uncontrolled VOM under the proposed adjusted standard and the volume of uncontrolled VOM with an approved oxidizer during Ozone season.

In that regard, FORMEL notes that USEPA indicates that the Illinois air shed receives approximately 849,348 tons per year of VOM. See USEPA, Office of Air Quality Planning and Standards (OAQPS), Regional Transport of Ozone/OTAG Report, dated October 30, 1997. Therein point sources are identified as generating 692.7006 tons per day; area sources generate 1,386.2820 tons per day, with mobile sources reportedly generating 248 tons per day VOM in the State of Illinois. FORMEL recognizes that USEPA's description of the Illinois air shed differs from the IEPA's analysis somewhat. Specifically, the IEPA reports that stationary sources account only for 134,924 tons per year VOM from permitted facilities in Illinois. See Illinois Annual Air Quality Report, 1998 (IEPA September, 1999) at Table 5. Nonetheless, FORMEL notes that the IEPA's report does not account for emissions from unpermitted stationary sources, and that neither IEPA nor USEPA report VOM that is transferred into the Illinois air shed by the prevailing winds. As such, the foregoing estimate is a remarkably conservative analysis for the purposes of quantifying the effect of FORMEL's operations on the Illinois air shed.

Moreover, it is widely known that ozone is formed by the reaction of hydrocarbons, nitrogen oxides and sunlight in the atmosphere. Specifically, "when reactive (non-methane) hydrocarbons and nitrogen oxides accumulate in the atmosphere and are exposed to the ultraviolet component of sunlight, the formation of new compounds, including ozone and peroxyacetyl nitrate, takes place." Illinois Annual Air Quality Report 1998 (IEPA, September, 1999) at p. 1. In Illinois, those atmospheric conditions are available for only five (5) months during each year.

Under the circumstances, FORMEL emits roughly 68 TPY VOM. Certainly 68 TPY VOM is insignificant in relation to the total air and VOM emissions found in the Illinois air shed (i.e. 849,348 TPY), forming roughly .008006141% of the total VOM annual emissions in Illinois. As such, the critical question is what is the quantitative effect of the adjusted standard in relation to the effect on the air shed if the rule of general applicability were followed. Specifically, if FORMEL were to comply with the Flexographic Printing Rule by choosing to control the VOM, then the Flexographic Printing Rule mandates that FORMEL control 60% of the VOM for 5/12 of the year. In other words, if the Board grants the proposed adjusted standard to FORMEL, then roughly 18 tons of VOM will not be controlled during the ozone season in Illinois, out of an annual VOM emissions of 849,348 TPY (or 5/12th thereof, or 18/353,895 = .005086254% of the VOM emissions during ozone season).

Note, according to the IEPA, there were only three exceedances of the National Ambient Air Quality Standard for Ozone in 1998:

There was one exceedance days [sic] recorded in the Chicago area, one exceedance day in the Metro-East [area], and one exceedance day in Jersey County (downwind of the St. Louis area). The highest one-hour concentration was 0.140 ppm in East St. Louis compared with a state-wide high one-hour value of 0.157 ppm in

1997. The highest value recorded in the Chicago area was 0.133 ppm in Evanston.

Suffice to say that FORMEL's accretion to the whole had no effect on the single Chicago area exceedance last year. Indeed, the IEPA clearly recognizes that sources outside of Illinois have a much larger effect on ozone exceedances in Illinois than FORMEL's operation.

Also, FORMEL is seeking an adjusted standard for emissions up to 99 TPY (41.25 VOM emissions during the ozone season). If control were added, 60% of the 41.25 tons would be controlled, or an additional 16.50 tons VOM would be present as a result of the proposed adjusted standard. Roughly 17 tons VOM out of an inventory of possibly 353,895 tons of VOM available during ozone season is insignificant. To the extent that there were three (3) exceedance days in Illinois (and one was attributable to transport factors outside of the State), the sole Chicago area exceedance would not be adversely or beneficially affected by FORMEL's proposed adjusted standard.

Finally, to the extent that the Board's Emissions Reduction Market System Rules at 35 IAC Part 205 (the "ERMS" Rules) apply to FORMEL, then FORMEL's emissions will be reviewed during the ozone season (or control mandated as a result of the ERMS Rule) outside of the proposed adjusted standard or Flexographic Printing Rule. In other words, the ERMS Rule will operate as check on the proposed adjusted standard. Indeed, to the extent that FORMEL experiences any ERMS Rule exceedances during the ozone season, then FORMEL will be required to provide control or purchase emissions credits on the open market, thereby actually increasing the benefit to the Illinois air shed by removing emission credits that would otherwise be available to other sources of VOM.

FORMEL may be considered a participating source in the ERMS Reduction Program pursuant to 35 IAC Part 205. If necessary, FORMEL will file an application as a participating

source within 90 days after the Board grants FORMEL's petition for an adjusted standard. For purposes of determining the baseline ATUs for FORMEL, the compliance level should be based on the adjusted standard and not the Flexographic Printing Rule.

H. Justification (Section 106.705(h))

After the Flexographic Printing Rule was adopted, it became clear that FORMEL could not achieve compliance without incurring extraordinary costs and expense. The Flexographic Printing Rule is not reasonable as applied to FORMEL's "job shop" operations as hereinabove described. The RACT adjusted standard proposed by FORMEL is justified because it is technically feasible, economically reasonable and will have no significant adverse impact on the ambient air quality in the Chicago Metropolitan area

1. Consistency with Federal Procedural Requirements (Section 106.705 (i))

1. Consistency with Federal Law

By granting the proposed adjusted standard, the Board will not violate any provisions of the CAA. FORMEL's printing operations and the appropriate RACT requirements applicable to FORMEL are subject to this proceeding. Pursuant to the Act and the CAA, the Board is empowered to determine what constitutes RACT. And, in granting the requested relief, the Board will be determining what is RACT for FORMEL. Accordingly, under its authority to adopt RACT regulations, the Board may grant the requested relief consistent with federal law.

2. Federal Procedural Requirements

Under federal law, the Board's grant of the adjusted standard requested by FORMEL will be submitted to the USEPA for inclusion as a RACT rule specific to FORMEL in the State Implementation Plan for Illinois. As such, the adjusted standard will comport with federal procedural requirements.

J. Hearing - Section 106.705(j).

FORMEL requests a Hearing in this matter before the Board.

K. Supporting Documents (Section 106.705(k)).

Supporting documents cited in this petition are attached hereto as Exhibits "A," "B" and "C."

III. SECTION 28.1(c) FACTORS

Under Section 28.1(c) of the Act, 415 ILCS 5/28.1, the Board may grant individual adjusted standards upon adequate proof that: (1) the factors relating to the petitioner are substantially and significantly different; (2) the existence of those factors justifies an adjusted standard; (3) the requested standard will not result in adverse environmental or health effects; and (4) the proposed adjusted standard is consistent with federal law.

A. The Factors Relating to FORMEL Are Substantially and Significant Different.

The specific factors relating to FORMEL are substantially and significantly different than the general factors that were relied upon by the Board in the rulemaking that culminated in the Flexographic Printing Rule. The Flexographic Printing Rule rightly considered large flexographic printing operations that have a significant effect on air quality, and those whose share of the flexographic printing industry provides them with the opportunity to absorb the costs of compliance at a reasonable ratio. The Flexographic Printing Rule did not consider small, "job shop" operations with short-term jobs, printing on the outside surface of a "high-slip" substrate for customers with precise specifications and high-quality needs, and in smaller "job shop" lots.

Indeed, the Flexographic Printing Rule comfortably applies to large flexographic printers who can absorb the costs of compliance, who may dedicate presses or separate operations to water-based inks, and who can reasonably afford control for those presses and operations that have the same needs for solvent-based inks as FORMEL. FORMEL has

concluded that the same economic considerations that apply to larger flexographic printers do not apply to FORMEL, and that it is not economically reasonable nor, at this time, technically feasible for FORMEL to comply with the same rules that were adopted by the Board in the Flexographic Printing Rule at 35 Ill. Adm. Code, Subpart H, 218.401 et seq.

B. The Existence of These Factors Justifies an Adjusted Standard

As discussed fully in this petition, FORMEL has investigated a number of compliance options. The compliance alternatives investigated include experiments with currently-available water-based inks and the installation of add-on controls. In addition, FORMEL has investigated various alternative technologies (such as bio-filtration) in hopes of providing a reasonable technical alternative. These alternatives have not proven to be technically feasible or economically reasonable. Under the circumstances, the requested adjusted standard is technically and economically justified as the only means available.

C. The Requested Standard Will Not Result in an Adverse Environmental Impact or Health Effect

As discussed previously in this petition, the requested adjusted standard will not have an adverse environmental impact or health effect. FORMEL is a small, "job shop." Indeed, its uniqueness as a very small participant in the flexographic industry tracks well with its negligible impact on the air shed.

D. The Proposed Adjusted Standard Is Consistent With Applicable Federal Law

The proposed adjusted standard is consistent with federal law as discussed in the petition. The granting of the adjusted standard will not violate any provision of the CAA because no federal RACT standards have been established that are applicable to FORMEL's specific, "job shop" printing operations.

IV. CONCLUSION

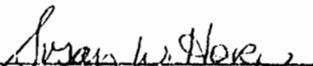
FORMEL requests that the Board grant the proposed adjusted standard as an alternative to the RACT regulations adopted by the Board in the Flexographic Printing Rule. To

require FORMEL to comply with the requirements of 35 Ill. Adm. Code Section Subpart H, Section 218.401 *et seq.* would result in substantial economic hardship to FORMEL with no corresponding or proportional environmental benefit. Moreover, it is not technically feasible for FORMEL to comply with the Flexographic Printing Rule because: (1) water-based inks do not work; and (2) an oxidizer (as the only control device that works) presents unreasonable expenses for design and installation for old presses that were not designed with control in mind.

Pursuant to 35 Ill. Adm. Code 106.706, FORMEL submits the technical report prepared in support of this petition by Air Solutions, Inc. (attached as Exhibit "B") and the Affidavit of Mr. Donald O'Malley, President of FORMEL (attached as Exhibit "C"), to verify the facts asserted in this petition.

WHEREFORE, Formel Industries, Inc. respectfully requests that the Board grant FORMEL the proposed adjusted standard from 35 Ill. Adm. Code Subpart H, Section 218.401(a), (b) and (c) as that rule applies to the emissions of VOM from the flexographic printing operations at FORMEL's operations in Franklin Park, Cook County, Illinois.

Formel Industries, Inc.

By: 

One of its Attorneys

William J. Anaya
Susan W. Horn
JOHNSON & BELL, LTD.
222 North La Salle Street
Suite 2200
Chicago, Illinois 60601
312-372-0770

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