



March 7, 2001

Ms. Karen Chu
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Mail Code 7406
Washington, DC 20044

Re: Choosing Among Flexo Ink Options: An Evaluation of Inks from Three Systems, Draft, January 31, 2001

Dear Ms. Chu:

The Flexible Packaging Association (FPA) appreciates the opportunity to comment on the January 31, 2001 Draft "Choosing Among Flexo Ink Options: An Evaluation of Inks from Three Systems," distributed by the Office of Pollution Prevention for comment. While FPA believes that the conclusions of the Report contained in Table 23 "General Ways to Reduce Hazards and Risks Related to Flexo Inks," are of great value, FPA is quite troubled by the unscientific and unsupportable manner in which the Booklet conveys Agency conclusions that chemicals in ink present "clear" and/or "probable" health and occupational risks to workers in press rooms, the public, and the environment. The booklet's casual and technically flawed presentation is great cause for concern and undermines the Agency's effort. Every effort should be made to remedy these discussions before the Booklet is published.

FPA's specific comments follow:

Introduction - Page 4 - The report's "*Introduction*" indicates that one goal of the project was to help printers select the "cleanest" inks. This was never defined as a goal to study participants. Rather, FPA understood that the Project's goal was to compare the three systems and determine which ink performed better, at a lower cost and with lower risk. In order to accomplish such a comparison, optimization of the process parameters (e.g., press run speed) would have been needed.

EPA's assumptions regarding how it evaluated risk and cost are not outlined anywhere in the booklet. The assumption of most concern to this industry is of course risk. It appears to us that no assumptions were made regarding occupational safety practices such as wearing protective gloves, for instance. (It is not until page 28 that EPA states "if all workers wear appropriate gloves whenever they handle inks,

almost all dermal risks will be eliminated.) FPA urges the Agency to include a brief discussion at the front of the report that indicates clearly that its assessment of risk to chemicals in the different ink processes was based on the chemicals themselves in an "uncontrolled" environment. The Agency could use this sort of description to emphasize – up front – the importance of the work practices contained at the back of the booklet.

Page 5 - The last sentence indicates that one of the most important findings of the study was no ink system is superior. We think that this is an accurate conclusion. However, it also should be noted that the Project failed to optimize run conditions for each system, and therefore the results of an optimization might lead to a different conclusion. Since the Agency assumed presses could only run at 500 feet/minute, they should state that up-front as one of the assumptions of the study.

Page 7 - FPA feels that the most important point overlooked in comparing flexo ink systems in the study is product quality and performance. If you cannot produce the product the other issues are of no consequence. Even though the study did not evaluate this factor, a note or discussion should be added to the booklet recognizing the importance of product quality, performance and customer satisfaction (which the industry feels is the most important element).

Page 9 - The report states that water based inks can cost more to dispose of and that water-based inks cannot be used as fuel in industrial incinerators. That is not always the case. Water based inks can be used for fuel in industrial incinerators. If the water base material is a hazardous waste with a BTU value greater than 5000 it can be used for fuel blending. If the material is a hazardous waste with a BTU value less than 5000 BTU's it cannot be used for fuel blending. Any water base material that is not a hazardous waste, but still must be managed as a hazardous material, can be used for fuel blending.

Page 10 - FPA recommends deleting the last sentence under the heading Solvents, which reads: "A solvent should also have minimal flammability and toxicity concerns." Since this section of the report discusses the properties of solvents in inks, this sentence is neither useful nor relevant.

Pages 11-12 - EPA wants to know if table I will be useful to printers and if its usefulness could be improved. FPA recommends that Table One not be included in the booklet. The table doesn't seem to have any value for a flexo operation and is likely to be confusing. The ink manufacturer will help the printer make decisions regarding material content based on the product being produced.

Page 14 - FPA urges EPA to remove the "box" on page 14 from the booklet. (We repeat this comment below since the same discussion of risk and the "box" reappear three times in the booklet, and underscore here how critical we think this edit is to the integrity of the booklet.) "Risk" is a term that has many regulatory meanings, none of which are accurately conveyed by the Agency in the box. That is partially a function of the fact, as EPA tries to explain in the accompanying text, that risk is related to

exposure, toxicity, dose and receptor. Therefore, the repeated use of the two terms *clear risk* and *probable risk* are highly simplistic and indeed, not accurate at all. They must be removed. The presence of a compound in a product has nothing to do with whether it presents a clear risk or probable risk, and EPA's attempt to classify health risks on this basis is technically unsupportable. The type of communication highlighted in the Box is likely to mislead not only EHS personnel, but also the public.

Generally, EPA's discussion of "risk" is very troublesome and FPA's comments apply equally to the Agency's discussion of water and UV inks, not just solvent-based inks. Disclaimers such as the one that accompanies Table 3.1 apparently intended to indicate that lists of chemicals along side their toxic effect or endpoint "is not meant to imply anything about possible exposure, dose or severity of effects " are helpful, but does nothing to modulate the presentation of risk conveyed by headings such as "clear risk" or "probable risk" throughout the discussion and most particularly in Table headings (*see e.g.*, Tables 14-16). The Agency also has done a very poor job of augmenting these discussions with analysis concerning how through controls and other precautions risk is minimized (i.e., see FPA's comment above regarding the booklet's failure to mention such minor, but *extremely important*, practices such as wearing gloves.)

In response to the specific question posed by the Agency at the bottom of the page, FPA submits that EPA's use of the term "safety" is similarly misguided. Although we appreciate that EPA also has included statements such as "the findings of this study provide helpful insights but should not be taken as absolute," this box conveys that if a chemical is in a product, the product is unsafe. In response to the author's request for comment on the use of "safety", we believe it should be removed from the text of the booklet.

Page 15 - In the list of bullets, EPA should replace the word "presented" with the words "may present" or use the term "associated risks". The Agency has no basis to say without qualification that solvents in solvent-based inks present systemic and developmental risks. Similarly Table 2, titled "Clear Health Risks of Solvent-Based Inks for Flexo Workers," is misleading and inaccurate. As the Agency pointed out on page 14, risk is a function of exposure and dose and other factors. Conveying that "clear risks" result to flexo workers in the industry is not a responsible use of the Agency's considerable authority.

Page 16 - Under Performance of solvent based inks, we see a statement that *Overall, however, solvent based inks performed no better or worse than water based or UV cured inks* This fact is probably true given the fact that the test used un-natural limits on the inks, as all tests were run at the same speed, an inherent bias in the agency's methodology. It should be noted that the reason many companies are more productive with solvent-based inks is the fact they can run faster and therefore, produce more product at the same operating costs. This single factor skews the report's conclusions, so it would be important to underscore it somewhere in the discussion.

Page 17 - Table 4 on page 17 would be more representative if it reflected the capability of the presses to run at full speed possible and then factor in the costs based on speed run. It also should emphasize in the booklet the impact if presses using solvent-based inks had a portion of the exhaust air recirculated into the press make-up air. A press that has been recirculated by 40 * 50% reduces the press-heating requirement and in many cases, the resultant savings in energy in the press equals the added energy of the emission control unit. Without knowing how the presses were equipped, we again can see an inaccurate cost of operation.

Page 20 - On both the text at the top of the page and in Table 6, EPA conveys that there are "Clear" risks to workers and certain chemical categories "presented clear systemic and developmental health risks for workers." These sections need to be edited carefully, with use of such qualifiers as "may" or "have been associated" or "could be in the absence of other protective work practices."

Page 21 - CO2 is not a pollutant, and it is not regulated by the Clean Air Act. It may be an emission of concern, but EPA should be consistent in its use of terminology.

Page 23 -- As we have commented earlier, the "box" with the terms "clear risk" and references to "safety" should be carefully reedited or removed from the text.

Page 24 - FPA objects again to the unqualified discussion of "high risk" of certain chemical categories, and recommends again in Table 10 that the word "clear" be removed and a phrase such as "risks associated with" be substituted.

In the margin on page 24, we see a notation in a "box" that dermal risks can be managed by having workers wear gloves whenever handling inks. This notation should be included in all ink technologies as this is common practice in pressrooms.

Page 25 - In the first paragraph of the section entitled Performance of UV-cured inks, we noted the sentence in italics which states the tests were based on work early in the development of the technology and should not lead to any conclusions about the abilities of UV inks. This same statement likely holds true for segments of all ink technologies. All technologies are continuing to make improvements.

Page 27 - On this page, we see the costs for UV-cured inks, which mirror the costs for the other technologies. The one item that is not included in any of the costs for the various technologies (including this one) is the basis for electrical and natural gas energy. In the world of ever increasing cost escalation of energy, the report should at least provide data on the cost per therm for gas and cost per KW for electrical power used in the study. The other item that should be included would be the cost breakdown of both utilities for each of the non-UV technologies.

Pages 28-31 - Again, we recommend that EPA's conclusions italicized on the bottom of page 28 and in Tables 14-16, that the study found "*clear* occupational risk

to workers for certain chemical categories in every ink system" needs to be qualified since EPA did not study work practices, only opportunities for risk reduction.

Page 33 - In the paragraph entitled "Performance of all ink systems," we see a statement that there was no clear evidence that any ink system performed best overall. Again, the artificial speed limit on all three technologies resulted in the Agency's inability to make any conclusion regarding performance. (FPA also notes that because there is no discussion in the report whether any of the products produced are sellable, another key component may be missing in the study.)

Page 34 - This page addresses energy use, but as pointed out above, does not address if the solvent based presses were equipped with recirculation. This can have a huge impact on the results (as noted earlier) and needs to be clarified. Further down in the page it lists the pollutants released from the various ink systems, but the study does not specify what levels of VOCs were in the water-based inks. Thus the discussion would be misleading unless the levels of VOCs in various inks were compared.

Page 35 - In the paragraph before table 19, we see that technical advances may allow printers to run faster. We know that VOC based presses can run faster. The report should acknowledge that speed of the press could impact findings shown throughout the report.

Page 36 - Table 21 is problematic because it seems to indicate that EPA has regulated certain chemicals under each of the statutes listed, but doesn't say how they have been regulated or for what uses. Either a second table should be added that lists each chemical and which rule applies to that chemical with a brief summary or the Agency should delete Table 21.

Page 45 - On this page, for the first time we see that energy consumption can be reduced by recirculating press exhaust air. This should have been inserted earlier in the study and clarified if the presses used this or not. In this section, we also see that printers can select water-based inks with the lowest VOC content, but one addition to the sentence should be *that will meet product specifications*.

Page 46 - On this page under the section *Pre-Press*, please note that Perchloroethylene is no longer used in plate washing. This bullet should be removed.

On this page under the section labeled *Printing* the reference to chambered doctor blades should be moved to the first position, as EPA's own studies have shown that this addition to an older press can have dramatic impact on fugitive emissions.

Note that perchloroethylene is no longer used in plate washing. Remove this bullet.

Printing the thinnest ink possible is what all printers do to reduce cost. The product quality and performance determine how much ink will be required.

Page 47 - Methanol is not used in the flexible packaging industry. Methanol has only been used as a denaturant in ethanol. Printers changed this in the late 80's to early 90's to avoid reporting under SARA 313. As result of this change the MIBK and MEK levels were also changed as a denaturant in ethanol.

Page 48 - The on-press cleaning systems tend to use a lot more solvent than hand cleaning. Therefore, some type of solvent recovery is required.

Sincerely,

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