

06/05/1984

VOC210605841

**Category:** 21 – Graphic Arts

MEMORANDUM

**Subject:** Graphic Arts CTG Requirements

**Date:** 06/05/84

**From:** James C. Berry, Chief  
Chemicals and Petroleum Branch (MD-13)

**To:** Doug Cook, Environmental Scientist  
Air Planning Section, Air Management Branch (Region IV)

This is in response to the February 22, 1984, letter from Ms. Nancy E. Wright of the Florida Department of Environmental Regulations concerning graphic arts RACT limitations. She asked two questions which we were requested to answer.

1. In what ways were the emissions from two RACT technologies (low-solvent inks vs. add-on controls) considered comparable?

I am certain that the question arises largely because the limit for low-solvent inks on packaging rotogravure and flexography operations is sometimes more stringent than if abatement equipment is used. The difference is intentional to clarify the reason for the differences. I must briefly explain our program for analysis of emissions from a variety of sources as it took place in the late 1970's.

The printing industry was one of the last industries studied. More than a year earlier, we had published a guideline for paper-coating that required essentially 81 percent control. This control level was recommended as a result of analyzing the capabilities and cost of suitable abatement equipment for a variety of web-coating industries. The guideline also would allow compliance via adoption of a low-solvent coating whose allowable solvent content was calculated to have emissions equivalent to the discharge from a complying abatement device.

Equipment used for printing on webs is very similar to that used to coat webs. There are two main differences. First, unlike a coating operation where the entire web is usually coated the "coverage" or portion of the exposed web on which printing is performed can vary dramatically from as little as 1 or 2 percent to as much as 300 to 400 percent. This affects the solvent emission rate, makes it far more difficult to maximize solvent concentration in the dryer exhaust and thereby increases the cost of abatement. The second major difference is the physical arrangement of the ink fountains which varies by type of printing operation rendering some less susceptible to efficient containment of evaporative losses.

We concluded that the physical constraints of printing machinery and operations would likely preclude retrofitting such equipment to achieve the same levels of control possible with similar equipment used to coat a web. The

ink industry subsequently asked that we write the guidance in a fashion that provided incentive for developing low-solvent inks, even through such inks did not exist (and the printing industry had little hope that they could be developed).

We subsequently accommodated the request but saw no reason why the physical constraints of different types of printing equipment should predetermine the characteristics of its "complying inks."

To set the VOC value for complying inks and coatings for the web-printing industry identical to that for the web-coating industry (81 percent) seemed inappropriate in as much as that would effect better VOC reduction than an abatement device could reasonably achieve on the most easily-controlled type of printing operation (publication rotogravure). Hence, we selected 75 percent (a figure recommended by an ink supplier) as the reduction required for compliance by low-solvent inks for all printing operations regardless of the type of press.

It might be of interest to note that at the time the guidelines was prepared although we recognized the overall desirability of low-solvent inks. Abatement was the only control option which appeared likely to be available within the time constraints mandated by the Clean Air Act. The low-solvent target was a concession (which we willingly made) to one ink manufacturer who although he had previously invested considerable research in waterborne inks had been unable to find printers willing to investigate and experiment with his product.

2. When the 75 percent H<sub>2</sub>O/25 percent VOC figure was calculated for waterborne inks did that figure take into account the use of "make-up" or "clear-up" solvents to make emissions comparable to emissions from add-on controls?

The recommendations in the guidelines for waterborne and low-solvent inks includes all solvent added to the ink as dilution or make-up solvent. It does not include clean-up solvents which are not added to the inks, but which are used to clean the printing press, printing plates or rolls, spills and transportable containers. Although we realize that a significant amount of solvent may be used for cleaning purposes, we knew of no way, other than by mandating operating practices, to limit solvent used in this manner.

It is possible that detergent may be a suitable substitute for cleaning solvent (we don't know) but at least, the State or local Agency should assure a plant has suitable procedures to provide covered vessels for storing the cleaning solvents and instructs the operators in the uses of solvent and appropriate disposal.

cc: Tom Helms (MD-15)  
Darryl Tyler (MD-15)