12/20/1978 VOC011220781

Category: 1 — Surface Coating of Cans

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

DATE: 20 DEC 1978

SUBJECT: Availability of End Seal Compounds for Can Manufacturing Operations

FROM: G. T. Helms, Chief
Control Programs Operations Branch (MD-15)

TO: Air Branch Chief, Regions I—X

I have received several requests for information regarding the availability of end seal compounds for can manufacturing operations. In order to help you better understand some of the apparently contradictory and conflicting comments being made at public hearings, I am attaching two letters from vendors of end seal compounds and an analysis of the situation made by the Emission Standards and Engineering Division.

I do not feel that any change in the existing guidance is necessary, and I would suggest that States follow the approach suggested in Mr. Rhoads' memorandum of November 21, 1978, "RACT Options for Can Coating Operations." Please make sure that States which have received comments on end seal compounds have a copy of this information.

Attachments

cc: R. C. Campbell
B. J. Steigerwald

Attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

DATE: December 20, 1978

SUBJECT: RACT Number for Can Coating End Sealing Compound

FROM: Michael R. Clowers
Chemical Application Section (MD/13)

TO: James C. Berry, Chief
Chemical Application Section (MD/13)

This memo is a summary of the information gathered in response to complaints by American Can Company and Dewey and Almy Division of W.R. Grace Company concerning the Volatile Organic Compounds (VOC) emission limit for can end sealing compounds (ESC) in the control techniques guidelines document for can coating.

Emissions of VOC from end sealing compound operations represent approximately 10 percent of solvent emissions in can plants. The RACT number for end sealing compound is 3.7 pounds solvent per gallon of coating less water. American Can Company representative, Dick McKirahan, maintains that this number is impossible to comply with for the vast majority of can manufacturers. The number can be complied with by the use of a high solids or water-borne ESC. Mr. McKirahan agreed that a water-borne could comply but that they are not commercially proven or available except for minor uses such as oily products (tuna). He stated that a great amount of time for testing would be required before any water-borne ESC could be put into commercial use.

Maureen Dalton, a representative of Dewey and Almy Division of W.R. Grace Company (producers of 90 percent of ESC) gave the following problems in high solids and water-bornes.

1. High solids is limited by the demands of rheological properties necessary for high speed application.

2. Water-bornes have problems in drying of the film. In certain climatic conditions, the water-bornes would require conditioning of the air (if air dry) or the use of ovens. These represent large capital and operating costs.

Due to these obstacles, D&A does not feel that they will have compliance products until 1982. Dick McKirahan then stated that the time can makers require for in-house and customer qualification procedures would preclude large scale commercial conversions in the two-piece market until 1983 and in the three-piece sanitary market until 1985.

Mr. McKirahan and Mrs. Dalton suggested that a truly reasonable RACT number would be 4.2 pounds of solvent per gallon of coating less water. This

represents a 13.5 percent increase from the RACT number. This would cause the quantity of emissions for the total can plant to be 1.35 percent higher than emissions with the RACT numbers in force. Mrs. Dalton said that the 4.2 number could be met with minor coating formulation change.

M & T Chemicals produce approximately 9 percent of the ESC in use. A spokesman of M & T said (9-18-78) that if we wanted to achieve an emission reduction we should leave the RACT number at 3.7. He said the 4.2 number would require virtually no formulation change in coatings and M & T would rather aim their research toward making a significant change in the solvent content of coatings. He also stated that M & T has investigated water-bornes and decided that they are not the answer for low-solvent coatings. The primary problem was the fact that they could not develop an air dry ESC. They have begun a program investigating high-solids ESC and their initial findings are quite promising.

Dick Caplan of Midland Division of Dexter Corporation (< 1% ESC sales) said that Midland has 3 water-borne ESC which meet the RACT number. Their applicability are virtually universal: oily, non-oily, food and beverage. Mr. Caplan has sent samples to EMB to be tested by Roger Shigehara for solvent content and percent solids. He also stated that the compounds were being tested by Campbell Soup Company and Anheiser Busch Corporation in St. Louis, Missouri.

Conversation with Bill Hardwick of Busch gave the impression that the Midland compounds were promising. The testing performed at Busch included taste sealing and seam analysis. Flavor or taste evaluation entailed injecting the ESC into the beer, pasteurizing it and then subjecting it to taste tests. Preliminary seal testing at 110 Degrees C for one and two weeks revealed no noticeable CO leaks. Seam analysis involved opening the double seam (3 piece can) and inspecting the joining of the can end and body. The Midland products have "passed" these tests and Mr. Hardwick feels that they will run commercial trials in order to conduct more extensive testing and derive more practical data. He also added that Busch is testing water-borne ESC other than those of Midland (H.B. Fuller Company) and although they are further behind in the testing schedule; they also appear promising.

George Scharland of Campbell Soup Company stated that they were testing the Midland compounds as air-dry i.e., not heat assisted. They are being tested on a wide range of products. They are being tested for fat and bio-resistance. He stated that the testing is by no means at a commercial stage. He feels that implementation of water-borne ESC is one to three years away depending on the problems that are always involved in such a change. He did not feel that Campbell will have any trouble with the 3.7 RACT number since it is not to be complied with until 1982. He also stated that water-borne ESC are very feasible and desirable.

Subsequent conversations with Mr. McKirahan for his comments on the development and testing of "promising" water-borne ESC brought out his primary concern. He explained that American Can Company presently uses at least 40 different ESC. He noted that Campbell and Busch have "1 product" applications and do not need the variety of performance characteristics that American Can

does. He gave the example that American Can produces an aerosol can that will contain 15 different products (i.e., it is sold to different companies who place their particular product in it) and therefore the ESC must be compatible with all of the 15 products. To reformulate this type of ESC would require the amounts of time (1985) that he feels that our 3.7 number can be complied with. He thereby felt that his suggested RACT number of 4.2 should be adopted.

The CTG limitation on ESC emissions presumed an increase in the solids content of a typical organic-borne coating from 30 to 50 percent. Commercial use of solids content up to 45 percent were noted during trips to various can coating facilities in 1975 and 1976. Water-borne coatings for some unique products are applied as low as 2.2 pounds of solvent per gallon of coating minus water.

Although the specific ESC coating on which the RACT number was based is no longer on the market (the supplier removed it from the market when the FDA threatened to investigate the use of compounds with acrylonitrile) it appears very likely that commercial quantities of compliance ESC's will be available by 1982. I therefore, recommend that the RACT limitation for can ESC remain at 3.7.

Enclosures

Enclosure

MIDLAND

RICHARD E. CAPLAN
VICE PRESIDENT
PACKAGING PRODUCTS

December 8, 1978

Mr. Michael Clowers
Chemical Engineer
EPA
Research Triangle
Mail Drop 13
North Carolina 27711

Dear Mr. Clowers:

Our Mr. Paul Munford has apparently been in contact with you regarding water base gasket compound. I am also advised that you are interested in the status of such programs at Midland.

It is entirely possible that we have misunderstood some remarks supposedly made about our company, and our ability to produce, water base gasket compound.

1. Midland is committed to an ongoing program to provide water gasket compounds for both beer and beverage ends and ends for use on sanitary cans.

2. Our BC3-150A water base compound has passed all initial performance and flavor testing at a major brewery via a major can producer and is now scheduled for larger scale production runs.

3. Our BC3-150A compound has passed microbiological testing at a major can company and larger scale production runs are now scheduled.

4. We presently are capable of making millions of pounds of water base gasket compound on "in place", high speed, modern equipment. This equipment is available for your personal viewing at any time you might desire and our engineers would be willing to discuss in detail the exact capability of the equipment.

5. If you are planning standards, relative to 1981, we would be in a position to increase any of our production sites in far less than two years to reach any production level beyond our present capability.

In effect we are saying: We are ready. We are not speaking for our competition or anyone other than Midland, but we are ready.

If you need additional information, if you wish to view our facilities, if you want our capability confirmed or if we may be of any additional help please let us know.

Sincerely,

Richard E. Caplan

/sm

Enclosure

GRACE

W. R. Grace & Co.
55 Hayden Avenue
Lexington, Mass. 02173
(617)861-4600

July 23, 1978

Mr. Michael Clowers
United States Environmental Protection Agency
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27211

Dear Mr. Clowers:

This letter is in response to your request for information on the present solvent levels in end sealing compounds manufactured by the Dewey and Almy Chemical Division of W. R. Grace & Co. and our comments regarding the timing of technological advances that will allow attainment of the EPA guideline of 3.7 pounds of solvent per gallon of compound.

The data below show the present solvent levels in solvent based and sealing compounds supplied by Deway and Almy throughout the United States. We have segregated those data according to three broadly defined categories of usage: beer/beverage, sanitary foods, and other. Numerous end sealant formulations are marketed within each category. The solvent levels shown below represent a weighted average based on the pounds of each compound sold in 1977.

Sealant Designation	Average Solvent Level Pounds/Gal.	Grams/Liter
Beer/beverage	4.12	494
Sanitary	4.23	507
Other	4.03	483

These numbers differ slightly from the numbers given to you verbally by Mr. M. Dalton on July 18, 1978.

In our professional opinion, present-day can sealants represent a balance between the optimization of rheological properties necessary for consistent application of the sealants and the optimization of sealing performance relative to can construction and the products to be packaged. Currently available technology which satisfies both of these requirements results in compound solvent levels which are higher than the 3.7 pounds VOC per gallon

proposal. To the best of our knowledge there are no oven free can end sealants commercially approved for use anywhere in the world that meet the proposed standard.

While this difference in VOC levels is on the average only 11% higher than the proposed limit, it should be recognized that the development of new end sealing compounds to meet the proposed VOC level requires new technology and a concentrated long-range research effort. Four years ago, Dewey and Almy embarked on two parallel research programs to introduce products to the beverage and sanitary food can makers which would comply with anticipated emission standards.

One program is aimed at increasing the percent total solids of our solvent based systems. Our limitation here was, and continues to be, the attainment of rheological properties necessary for high speed application.

The other program involves total elimination of solvents by using water as the diluent. One concern here centers around the sealing latitude needed for the more demanding three-piece cans used primarily for sanitary food packs. Another problem is an adequate means of consistently drying the film under all climatic conditions without the use of ovens.

While there are still obstacles to overcome in both programs, we have realized considerable progress. Assuming reasonable success in our research effort, our present goal is to introduce compliance products to meet the somewhat different needs of the beverage and sanitary markets by 1981. Assuming the can makers follow their normal in-house and customer qualification procedures, however, we would not expect to see large scale commercial conversions in the two-piece beverage market until 1983 and in the three-piece sanitary market until 1985.

We fully intend to do our part to successfully overcome the solvent emission problem. But in order to assure our customers and the general public that they can rely on compliance sealants to perform adequately, we need to be able to display consistent ability to apply sealants that meet the vigorous application and sealing demands of the beverage and sanitary food industries. No one in the sealant business is able to do this today.

Sincerely Yours,

Charles H. Ehlers

bcc: R. L. Carver
N. S. Dalton
D. A. Gibbs
R. C. Keane, Jr.
W. A. Hischel
George Payne - CMI
J. H. Reynolds, Jr.
D. B. Smith
R. C. Walsh