



STONER-MUDGE, INC.

GRANT BUILDING

PITTSBURGH, PA.

November 28, 1934.

Dr. Robert A. Kehoe,
University of Cincinnati,
Cincinnati, Ohio.

Dear Dr. Kehoe:

Thank you for your letter of November 20th, which arrived during my absence from the city. I have assembled considerable information on the subject of the lead content of our product and submit it herewith.

The problem might well be divided into two parts. The first part would be the case of white, or tinted coatings, and the second, that of the black coatings.

The white roller coating lacquer which we would like to use for the inside and outside of food container caps would have the following solid composition:

23. % Titanium Dioxide
2. % Lead Oxide (PbO sublimed)
18.7 % Vinyloid Resin
5.75% Plasticizer

This material may safely be estimated to cover about 1,000 square feet of tinplate surface. Its weight is very close to 10 pounds per gallon, so therefore 1 gallon would contain .2 of a pound, or 90 grams of PbO. On a basis of covering 1,000 square feet of area, 1 square foot would contain approximately .09 grams of the lead compound. Therefore a 2" round cap would contain approximately .0018 grams of PbO.

In the case of the black coating, there is present:

2.2 % Carbon Black
1.58 % PbO
15.8 % Vinyloid Resin
5. % Plasticizer

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Weighing 8 pounds per gallon, there is .126 pounds, or 57 grams, of PbO per gallon. The covering power of the black can be estimated safely at 1,500 square feet per gallon, therefore there is approximately .038 grams of PbO present in one square foot of coated surface, or .0008 grams present in the coating on a 2" cap.

Vinyloid resins are notable for their insolubility and high resistance to acid- and alkali-attack. The coatings for this purpose formulated from them are applied by a roller machine and are baked at about 375° F. to eliminate residual solvents and to produce maximum adhesion. What actually happens is that the resin is fluxed to the point where it actually wets the surface of the tinplate. Our tests run back a number of years on this product and we know that a coating stabilized with lead compounds can be used successfully for the linings of steel containers carrying either acid or alkaline solutions. We have a test cup in our laboratory now which has been filled with a 20% solution of Sodium Hydroxide for over two years without the slightest sign of attack. Of the acids, nitric seems to affect the coating most rapidly, visible signs of failure being noted after about a month has elapsed. Hydrochloric and sulphuric acids affect it much less rapidly in 20% solution. Of the organic acids, formic is probably the most rapid in effect, followed by phenol. Acetic acid will in time cause blisters, but this blistering requires many months to produce. Lactic and citric acids have no visible effect over several years duration. The tests mentioned are all conducted with 20% solutions.

It is therefore rather strongly impressed upon us that foods packed in containers having linings containing small percentages of lead could not be injurious to health because the lead could not be drawn from the coating. This is of course a matter of opinion, and no doubt some authorities would feel that the presence of lead, regardless of whether it could be assimilated or not, is a criterion.

Mr. Yant suggested asking your opinion on this matter because he felt that you were open-minded and that a condition such as ours is one requiring the use of judgment as well as the application of general rules set down in the past.

Dr. Robert A. Kehoe

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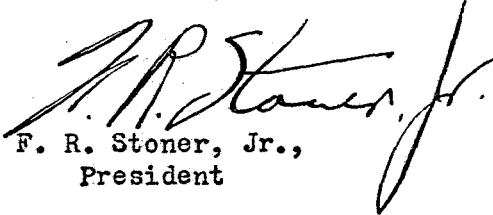
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I do not believe I mentioned it in my first letter, but it would be practical, although somewhat expensive, to overlay both the white and the black coatings with a coat of the Clear resin solution. We believe this would effectually insulate the pigmented material from any product with which it might come in contact. This is done in the case of the exterior black coatings as a matter of increasing the thickness of the coating and decreasing the tendency to scratch easily.

I am sorry that it has been necessary to go into such a lengthy discourse on this matter, but I have not been able to condense the material any further.

Yours very truly,

STONER-MUDGE, INC.



F. R. Stoner, Jr.,
President

FRS:JK

December 3, 1934

Mr. F. R. Stoner, Jr.
Stoner-Mudge, Inc.
Grant Building
Pittsburgh, Pa.

Dear Mr. Stoner:

Having gone over the information contained in your letter of November 28th, I can not but arrive at the same conclusion which you have reached, namely, that the use of the small amount of lead oxide in your product is entirely without possibility of harm. Such infinitesimal contamination of food materials or beverages with lead as a consequence of their contact with the type of surface which you describe, would seem to me to be certainly insignificant from an hygienic point of view. As you doubtless know we have found that most food materials and beverages contain measureable amounts of lead. It seems quite certain to me that it would be impossible to measure any additional amount which might be contributed by a material of the type you describe.

I have only one question in connection with your use of Plasticizer. Some of the materials which have been used for this purpose have been found to be toxic. I refer particularly to artho-cresyl-phosphate, and although it seems to me unlikely that you would use this material or that it could gain entrance into food materials in toxic amounts, it seems worth while, nevertheless, to raise the question. You will understand, I am sure, that I do not regard it as any of my affair but merely raise the point in passing.

Very truly yours,

RAK:IS

Robert A. Kehoe, M.D.

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