

Adolph Coors Company
Golden, Colorado

FEB 1 1974

Mr. Jeffrey H. Coors
Vice President, Research and Development
Adolph Coors Company
Golden, Colorado 80401

Dear Mr. Coors:

Thank you for your letter of January 8, 1974, concerning Asbestos
Particles in Food and Drugs (Federal Register, September 28, 1973).

We are forwarding your letter to the Hearing Clerk. You may be assured
that the information submitted will be considered in the promulgation
of regulations in this area.

Sincerely yours,

Robert C. Wetherell, Acting Director
Office of Legislative Services

cc: HFL-10(2)
cc: HFC-20(2) (Hearing Clerk)(w/cy inc)
P/D HHallerman 1/31/74
F/T mb 2/1/74

75P-0261

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January 8, 1974

Dr. A. M. Schmidt
Commissioner of Foods and Drugs
Food and Drug Administration
5600 Fishers Lane
Rockville, Maryland 20852

Dear Dr. Schmidt:

Re: Response to the petition concerning Asbestos Particles in Foods and Drugs
in the Federal Register, Vol. 38, No. 188; Friday, September 28, 1973

Adolph Coors Company is the fourth largest brewing company in the United States. We have sustained remarkable growth in our ten and one half western state sales territory because of the exceptional consumer acceptability of our product. This acceptability is achieved, in part, by the use of asbestos and cellulose filtration of the final product prior to packaging. Crysotile asbestos at levels of 3% is used in the filtration media to remove protein haze, bacteria and yeast. This allows us to fill our packages aseptically, thereby eliminating pasteurization. The beer is kept cold from the moment of filling until it reaches the consumer in our unique refrigerated marketing system. Since beer is subject to continuous flavor deterioration at temperatures above 50°F, our technique of keeping the beer cold by eliminating pasteurization enables us to deliver the freshest possible beer to the consumer.

Asbestos-cellulose filtration of beer is the most expensive type of final filtration available with the exception of absolute membrane filtration. Virtually every brewer in this country has switched to diatomaceous earth (powder) filtration. The flavor of our product is adversely affected by all diatomaceous earth powders commercially available. More importantly, a sterile product cannot be made using powder filtration without the addition of asbestos.

Because of recent publicity, we find ourselves extremely anxious about the health aspects of asbestos. We have spent a considerable amount of money and manpower to find a method for quantifying the asbestos level in liquids, to determine the quantities and source of asbestos in our beer, and to determine

if we can eliminate asbestos from our product. We have purchased a scanning electron microscope and have had a scientist working full time on this project over the last year.

At this time the significant conclusions of our investigation are:

1. A technique has been developed to quantify asbestos-like fibers in liquids. This technique is repeatable and has been substantiated by an outside laboratory.
2. The concentration of asbestos-like fibers in packaged beer and soft drinks is on the order of 10,000 times less than previously reported.
3. Asbestos filters shed very low concentrations of fibers into the product. These filters may even remove asbestos from products high in asbestos fiber concentration, such as contaminated water supplies.
4. Five micron membrane filters can retain 100% of asbestos fiber residuals in beer filtered through asbestos containing filter media.
5. The majority of the asbestos-like fibers found in packaged beverages are introduced by the packaging materials, which contain asbestos fibers picked up during manufacture or handling, and which are not completely rinsed off in commercial rinsing devices.

The method we have worked on was basically developed by Millipore Corporation, a Massachusetts company specializing in filtration. It was reported by them to the 1973 Proceedings of the American Institute of Chemical Engineers in Philadelphia. This method involves filtration of the sample through a membrane filter to catch and concentrate the fibers; ashing the membrane at 600°C to remove organics; slurrying and refiltration of the ash; and examination under a scanning electron microscope. All evidence points to 100% recovery of the fibers in the liquid. No fibers are detected in the filtrate. The prepared sample is examined at 3000 to 6000x, although a suspect fiber is often scrutinized at over 12,000x. Resolution of the microscope is 100 Å. Fibers as small as 500 Å in diameter have been seen and recovered by this technique. Electron microscopy is required because the majority of fibers in our beer are less than 0.5 microns in diameter and below the resolution of optical microscopies.

Our results have been confirmed with duplicate samples run by Millipore Corporation. This technique is repeatable and can be confirmed by any laboratory with a good scanning electron microscope.

We have found extremely low levels of asbestos-like fibers in our packaged product as well as several other beverage products on the market. In numerous tests of our product we have found between 60 and 500 fibers per liter, with an average of 200 fibers per liter. These values are 10,000 times

lower than the levels in the millions per liter found by Cunningham and Pontefract¹ in Canada and one fifth the values found in England by Biles and Emerson².

We have found similar fiber concentration levels in many major American beers and soft drinks, some of which were not filtered through an asbestos-containing media. We have found fiber concentrations of about 1500 fibers/liter in one Japanese beer and between 2,400 and 10,900 fibers/liter in Canadian beers.

In our search to find a way of eliminating asbestos from our product, we have tried membrane filters. In the laboratory, filters with a 5.0 micron absolute retention capability were able to remove all asbestos fibers of the type we use in our filtration even when massive quantities were injected into the beer prior to filtration. This is because fibers considerably smaller than 5.0 micron are trapped in the rather serpentine structure of the membrane filter.

A production-scale 5 micron membrane filter was installed in the beer supply line on one of our filling lines to determine production feasibility of a membrane filter. This fiber trap completely removed the 100 fibers per liter found in the beer prior to the membrane filter. The cost of this type of final filter trap would be four to five cents per barrel of beer, which would double existing filtration costs.

To our amazement, we found only a partial reduction of the asbestos in the packaged product. Further investigation revealed that the cans and bottles contained fibers which were not rinsed out prior to filling.

Containers are exposed to asbestos in their manufacture, in transfer from manufacture to filling and perhaps from municipal water used to rinse them prior to filling. We have detected over 200 fibers per container as we receive them. Even though we have a final rinsing operation, it has not been possible to substantially reduce the fiber levels in the cans and bottles prior to filling. We suspect this is the source of fibers in many of the products we have tested, since we know asbestos is not used in the manufacture of some of the beers and soft drinks we have examined. In our normal operation, the beer contributes 100 fibers per liter and the containers contribute 100 fibers per liter on the average.

Beer is normally filtered to remove submicron haze particles. In our own case, the turbidity of filtered beer is 0.2 parts per million silica, based on a fine grade of diatomaceous earth. When asbestos of the type used in our filter media is finely dispersed ultrasonically and injected into our beer to the levels reported by Cunningham and Pontefract (over a million

¹H. M. Cunningham and R. Pontefract, Asbestos Fibres in Beverages and Drinking Water, Nature, Vol. 232, July 30, 1971 p. 9.

²B. Biles and T. R. Emmerson, Examination of Fibres in Beer, Nature, Vol. 219, July 6, 1968, p. 93.

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fibers per liter) the turbidity of our beer more than doubles and the beer becomes noticeably cloudy to the human eye. (This is not to say all cloudy beer contains asbestos, because proteins and tannins in beer tend to coagulate with time and form haze)

We agree with your statement that asbestos fibers are ubiquitous in our environment. No one knows the total exposure human beings have to asbestos, but we have found that the exposure from beer and soft drinks is considerably lower than previously thought. Our work indicates that asbestos-cellulose filters do not shed large quantities of fibers. In fact, beer may be freer of asbestos fibers than many supplies of drinking water, because of the careful filtration to remove sub-micron haze in beer.

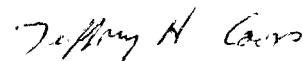
We are encouraged that 5.0 micron membrane filters are capable of removing all detectable fibers in our product. Although the expense would be great, we could install membrane fiber traps in all our lines if the low level of asbestos in our beer is determined to be hazardous.

We are discouraged that our cans and bottles, after careful rinsing, contain at least as many fibers as our beer. Any regulation eliminating the use of asbestos in filtration will not necessarily protect consumers from asbestos in beer and soft drinks. Regulation against the presence of asbestos in packaged beverages would destroy the packaged beverage industry, since the technology to remove or eliminate asbestos from containers on a production scale does not exist.

We certainly would hope that regulation, if necessary, would be based on tolerance limits allowed per liter of beverage rather than a ban on the use of asbestos and the complete elimination of fibers in containers.

A formal report is being prepared for publication and will be forwarded to you upon completion. We will be more than happy to collaborate with you in any way to evaluate our methods or to investigate the presence of asbestos in beverages. We sincerely hope our findings will be beneficial to you.

Sincerely,



Jeffrey H. Coors
Vice President, Research and Development

JHC:jh