

April 17, 1963

Dr. Paul L. Dent
606 South Fourth Street
Louisville, Kentucky

Dear Doctor Dent:

We are becoming increasingly concerned about the physiological effects of ethylene dichloride and vinylidene chloride. Both of these compounds, as you know, are currently used at the Louisville Plant.

We believe that it is essential that we perform liver function studies on all of our personnel exposed to either of these compounds. I believe you have been performing such studies locally on ethylene dichloride personnel, as outlined in my letter to Mr. Nelson of February 10, 1961. However, I would like to have the procedures modified whereby the laboratory studies will be made on blood serum by The B.F. Goodrich Department of Industrial Hygiene and Toxicology at Akron. I would like to have the serum specimens collected by you at the plant. We will supply you with the necessary containers for forwarding the serum to Akron. We will need a minimum of 3 ml. of serum. Following the collection of the blood at the plant, it should be coagulated and the cells separated. Only the serum is to be sent to Akron.

The studies are to be done on all personnel who have exposures to either ethylene dichloride or vinylidene chloride, and are to be repeated every six months. They are also to be done on all new assignments to the use of either of these compounds. If abnormalities are seen in the studies on these new assignments, then you should restrict them from exposure.

If you will advise me of the number of containers you require, we shall forward them to the plant for the collections.

Sincerely yours,

M.D.

Rex H. Wilson, M.D.

cc: Mr. L.O. Crunkleton
Mr. W.W. Baughman
Mr. A. Vittone

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PHIL LAWRENCE, PLANT MGR.

LOUISVILLE

M. N. JOHNSON, M.D.

DEPT. 0026, BLDG. 3-B

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Thank you very much for your kind hospitality on my recent visit to the Louisville Plant. I enjoyed touring the Plant and appreciated the time that you, Doug Schröder and the various general foremen spent with me.

I certainly did not see any obvious health hazards in my tour and I think your people are to be commended for running a very tight operation while handling products which could easily make for a sloppy and hazardous work environment if not handled carefully.

The two problem areas with which I think you need be concerned are the obvious noise problem and the potential problem of chemical vapor exposures.

So far as the noise is concerned, you certainly seem to have a good hearing conservation program and, in looking through a number of recent audiograms, it appears to me that the hearing of the plant employees is being well protected. All industry is, of course, obligated by OSHA to solve all noise hazard problems by engineering means, if this is feasible. I think your approach of tackling your noise engineering problems one at a time on a fixed schedule is an excellent plan. Even though you may well be inspected before you have solved all the noise problem areas, the fact that you can show evidence of a working plan which has produced results would certainly impress any compliance officer most favorably.

So far as the chemical vapor exposures are concerned, I don't think any of us knows exactly where that problem stands and I think the best approach is the one we discussed of doing some very extensive blood chemistry on the 250 or so employees whom we think could possibly be subject to an adverse exposure. From a purely scientific point of view, one is reluctant to resort to a "shot gun approach", but it seems to me to be the only practical approach in the present situation. I think that the arrangement which Dr. Creech has made, provided the Lab will do these at \$10 per examination and take the responsibility for the entire testing procedure from drawing the sample to reporting the results, is good and we should proceed with the testing program. The next step should be for me to come back and try to help Dr. Creech and your people interpret these results and decide:

1. What sort of on-going testing program is needed.
2. Which areas in the Plant, if any, need a thorough evaluation in terms of better definition of the vapor exposures involved.

Thank you again for your courtesies during my visit and I look forward to hearing from you when the testing program is completed.

M. N. Johnson, M.D., Director
Environmental Health Department

MMJ:mk

cc: R. H. Wilson, M.D.
J. L. Nelson

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INTER-ORGANIZATION CORRESPONDENCE

To Louisville, Ky. Attention Mr. L.G. Crankleton From Akron
9/0020 - B/S-1
(SHOW DEPT. & BLDG. IF AKRON)
 Your Letter _____ Subject _____ Date 8/14/63

Attached is the report of my recent visit to your plant. Walt Cato and I have agreed that several of these operations should again be re-evaluated within the next few months. I have also offered to Walt our services in any discussions or approvals of plans with respect to the enclosure of the cubers.

W.S. McCormick

cc: W.W. Baughman
 A. Vittona

USE THE BACK OF THIS SHEET FOR YOUR REPLY IF POSSIBLE

FORM 4512, 11-7-57
 LITHO. IN U.S.A.

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August 12, 1963

Report of Visit to Louisville Plant
August 5 - 6, 1963

On August 5 & 6, 1963 a visit was made to the Louisville Plant to evaluate several manufacturing operations from the standpoint of industrial hygiene. Recent examinations of personnel handling lead showed several with elevated blood and urinary levels. For this reason particular attention was paid to the lead handling operations. Noise measurements were made around the cubers to again indicate the severity of this noise exposure.

1. Results and Discussion

1. Handling of Lead Compounds: Atmospheric samples were collected at the weigh booth in Building 8, while Tribase E and basic lead carbonate were being weighed. The results of these are as follows:

<u>Sample No.</u>	<u>Atmospheric Exposure</u> <u>(Mg. of Lead/Cu.M. of Air)</u>	<u>Remarks</u>
1	.3	Operator's exposure while weighing Tribase E
2	3.2	Operator's exposure while weighing basic lead carbonate
3	1.6	Same as #1

All of the above samples were taken with the exhaust fan operating normally and with no visible restriction on any of the slots in the booth through which the exhaust is supplied. The above results indicate inadequate control of the dust arising from these weighing operations. Atmospheric exposures to lead compounds should not exceed 0.2 mg./cu.m. of air. Considerable variation in the three results occurred and is explained on the basis of variations between individual operators insofar as their weighing activities are concerned. Considerable spillage of dry pigments (lead compounds or others) was observed on the floor. This also adds to the general contamination in the atmosphere. It was estimated by Management that each of the weighmen handle, on an average, 500 lbs. of lead compounds per day, three days per week. This level of activity, being not full time, is an aid in the control of the individual lead exposures. However, in view of the above results, the operating characteristics of the exhaust fan should be evaluated. Sufficient ventilation needs to be provided to this booth to maintain a satisfactory working environment.

The charging level of the Farrell-Birmingham Mixer was inspected. No atmospheric samples were collected in view of the modifications which are still being made in this area.

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2. Noise Exposures: The noise levels incident to the cuber operations in this plant have been evaluated on numerous past occasions and recommendations made for their correction. Since the last measurements, however, additional cubers have been installed. Management indicated its desire to now move rapidly on the reduction of these noise exposures. Ear muffs have been provided to all cuber operators and their wearing has been made mandatory. This is commendable. Noise measurements were made as indicated in the following results:

Noise Level (Decibels)	Location	
99	Operator's exposure at #2 sewing machine	
99	Operator's exposure at the front of #1 mill	#8848 Gray Stock being processed
102	Operator's exposure between #2 and #3 cuber with all three cubers operating	
103	North side of #3 cuber. Only this cuber operating	
100	Operator's exposure at #2 sewing machine, #1 and #2 cubers operating	#8714 Charcoal Gray Stock being processed
96	Operator's exposure at #2 sewing machine, #1 cuber only operating. Some trouble with stock.	

The above results indicate definite noise hazards in the immediate area of the cubers and the need for controls. The above data are expressed only in terms of over-all levels. An attempt was made at the time of the visit to make an octave band analysis, but it was found that the instrument was not functioning properly, and therefore, these data are not reported. The wearing of ear protective devices by the cuber operators is a satisfactory control for these personnel. However, it does not provide a control for personnel working in immediate adjacent operations.

Audiograms have not been made of any of these personnel. This should be done now and repeated at least once each year so that a record may be maintained of the hearing status of each of these employees. Furthermore, all new assignees to the job of cuber operator should be given an audiogram and not assigned if their hearing loss exceeds an average of 15 decibels in either ear at the frequencies of 500, 1000, and 2000 cycles per second, or 30 decibels at 4000 cycles per second. The BFG form for the recording of these audiograms is attached to this report.

3. General: Examinations for those personnel handling ethylene dichloride or vinylidene chloride have been started. The procedures to be followed

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in evaluating these results were discussed with Dr. Creech and Mr. Cato. The examinations will be repeated every six months. They will also be performed on a pre-assignment basis to personnel entering operations involving exposures to either of these compounds.

Complete blood counts have been made of laboratory personnel handling nitrobenzene. These results have not as yet been sent to Akron for review and this should be done as soon as possible.

The other potential health hazards at this plant were found to be well controlled at the time of the visit.

W.E. McCormick

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maximum level for the vapor in air which is acceptable for prolonged exposure. The available evidence indicates that 25 parts per million is excessive.

Some vinylidene chloride is transferred from drums; it was noted that a drum leaked at the bung during transfer. Due to its high volatility (the vapor pressure at room temperature is approximately 500 mm. Hg.), high air concentrations may be produced as the result of leaks or spills. Exposure to 4000 parts per million for a few minutes produces "drunkenness" which may progress to unconsciousness if the exposure is continued.

- F. Operations involving use of ethylene dichloride and acrylonitrile do not appear to present health hazards in normal operations. Supplied air respirators are worn when cleaning polymerizers which have contained acrylonitrile.
- G. No noise evaluations were made, as no changes in equipment had been made since measurements were made recently by Mr. McCormick.

George L. Wilson

9/23/64

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REPORT OF VISIT TO LOUISVILLE PLANT
September 1-5, 1964

During the period September 1-5, 1964, an industrial hygiene survey was made at the Louisville Plant of The B.F. Goodrich Chemical Company. Following are our recommendations and the results of this survey.

I. Recommendations

- A. Improve exhaust ventilation at the skip hoist on the 4" Farrell line.
- B. Improve the work habits of personnel weighing pigments at the booth in Building 8.
- C. Emphasize the necessity of good personal hygiene among personnel handling toxic materials such as lead and antimony compounds.
- D. Prevent spillage of vinylidene chloride in drum handling operations.

II. Results

In order to evaluate potential health hazards, air samples were taken at several operations. The results follow:

A. Lead

<u>Sample No.</u>	<u>Mg. Lead Per cu. ft. of air</u>	<u>Remarks</u>
1	0.85	Workman's exposure weighing Pigment S-1 in Building 8.
2	0.84	Same as #1.
3	0.07	Workman's exposure weighing Pigment S-10 in Building 8.
4	0.60	Same as #3.
5	0.02	Workman's exposure at Henschel Mixer-extruder operation, processing 8737 Black 289 containing Pigment S-1.
6	0.02	Same as #5.
7	1.34	Workman's exposure at 4" Farrell, processing 8737 White 132 containing Pigment S-1.
8	1.12	Same as #7.
9	Over 0.80*	Same as #7 and 8, processing 82467 Slate 260 containing Pigment S-27.

*Sample taken with MSA Universal Sampler. Result cannot be expressed more exactly.

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B. Antimony

<u>Sample No.</u>	<u>Mg. Antimony/ cu. ft. of air</u>	<u>Remarks</u>
1	0.42	Workman's exposure weighing Code 708167 (Antimony Oxide) in Building 8.
2	0.38	Same as #1.
3	0.01	Workman's exposure at Henschel Mixer-extruder operation processing 8737 Black 289 containing 708167.
4	0.02	Same as #3.
5	0.04	Antimony in fume from mill on extruder line.
6	0.37	Workman's exposure at 4" Farrell, processing 8737 White 132 containing 708167.
7	0.1	Same as #6.

C. Vinyl Chloride During Cleaning of Polymerizer (1015F-V12 Resin)

<u>Sample No.</u>	<u>ppm Vinyl Chloride</u>	<u>Remarks</u>
1	150	Cleaner's exposure while scraping lower third of wall, Poly #23, Charge #2234, Building M.
2	120	Cleaner's exposure chiseling hardened material from agitator. Same location as #1.
3	120	Cleaner's exposure scraping bottom of poly. Same location as #1.
4	Less than 30	Cleaner's exposure while scraping lower third of wall, Poly #13, Charge #7647, Building 1.
5	None	Same as #4.
6	None	Same as #5, scraping on bottom.
7	120	Cleaner's exposure while scraping lower third of wall, Poly #17, Charge #2243, Building 18.
8	120	Same as #7, scraping half way up wall.
9	150	Same as #7, scraping bottom.

D. Vinylidene Chloride During Polymerizer Cleaning After Charges of Type 222 Resin, Building 13.

<u>Sample No.</u>	<u>ppm. Vinylidene Chloride*</u>	<u>Remarks</u>
1	25	Cleaner's exposure two minutes after cleaning started, scraping lower half of wall, Poly #15, Charge #5411.

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D. (Continued)

Sample No.	Ppm. Vinylidene Chloride*	Remarks
2	25	Same as #1, two minutes later.
3	10	Similar to #1 & 2, Poly #14, Charge #5418.
4	15	Same as #3.
5	10	Similar to #1 & 2, Poly #18, Charge #5423.
6	10	Same as #3.

*These concentrations may also include some cis 1,2-dichloroethylene, but calculated as vinylidene chloride. It could not be separated by the analytical technique used.

III. Comments

- A. Exposure to lead at the weigh booth in Building 8 usually exceeded the presently acceptable maximum level of 0.2 mg. per cubic meter of air by a wide margin. This condition appears to be caused primarily by poor work habits which reduce the effectiveness of the ventilation system. Lead compounds are habitually spilled onto the scale platform; in the process of opening paper bags to be filled, it was noted that one workman created a cloud of lead dust which enveloped him and the area to his rear. This increased the exposure of all personnel in the vicinity.

The weighman's exposure to lead at the skip hoist of the 4" Farrell unit was far above the presently acceptable maximum level. Airborne dust is generated when the hoist dumps into the mixer. Not all of it is captured by the exhaust fan. Some dust is no doubt scattered over a large area of the mill room.

The weighman's exposure to lead at the Henschel Mixer-extruder operation was well below the presently acceptable maximum level.

- B. Exposure to antimony at all locations checked was below the presently acceptable maximum level of 0.5 mg. per cubic meter of air. Exposure at the skip hoist mentioned above will be reduced substantially when the necessary steps have been taken to control airborne lead.
- C. Good personal hygiene is important in prevention of absorption of toxic materials such as lead and antimony. Thorough washing of the hands prior to eating and smoking is particularly important.
- D. Exposure to vinyl chloride vapors during polymerizer cleaning was well below the presently acceptable maximum level of 500 parts per million parts of air in the three polymerizers in which samples were taken.
- E. Vinylidene chloride may produce organic injury to the liver and kidneys upon repeated exposure. At the present time there is no established

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maximum level for the vapor in air which is acceptable for prolonged exposure. The available evidence indicates that 25 parts per million is excessive.

Some vinylidene chloride is transferred from drums; it was noted that a drum leaked at the bung during transfer. Due to its high volatility (the vapor pressure at room temperature is approximately 300 mm. Hg.), high air concentrations may be produced as the result of leaks or spills. Exposure to 4000 parts per million for a few minutes produces "drunkenness" which may progress to unconsciousness if the exposure is continued.

- F. Operations involving use of ethylene dichloride and acrylonitrile do not appear to present health hazards in normal operations. Supplied air respirators are worn when cleaning polymerizers which have contained acrylonitrile.
- G. No noise evaluations were made, as no changes in equipment had been made since measurements were made recently by Mr. McCormick.

George L. Wilson

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Dr. Nelson
J. L. Nelson

Cleveland Office

file
February 6, 1969

Louisville Plant

Kentucky Department of Health Report

Here is a copy of a report the Kentucky Department of Health has sent us concerning their recent visit which I described to you in Cleveland on January 30th. I have also sent a copy of this to McCormick. As you note, they are expecting us to arrange a meeting with them and though not mentioned in the report, they have indicated to us that representatives of the U.S. Public Health Service should also be in attendance.

We have left it with them that we will arrange a meeting in late February or early March. We prefer early March and Dr. Creech has indicated that he would like very much for Dr. Wilson and McCormick to be present. I have left it with Bill to select a date agreeable to all concerned and to let me know his preferences so that we can proceed to finalize the meeting arrangements, or if he chooses, perhaps he would prefer to make the arrangements himself.

As you also note, I gave them the expected costs of these water cleaning installations at their request. Ordinarily, we would not make known equipment costs, however, since the equipment is not a production or new product installation and the hand problem is so serious, I felt that it was appropriate and in our best interests to give them frank information on this substantial expenditure being made in an effort to solve this problem.

Our contact on this matter is John H. Callis, Chief Industrial Hygienist, Occupational Health Program, Division of Environmental Health, Frankfort, Kentucky, Phone 564-3380.

L. G. Crunkleton
L. G. Crunkleton

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attch.

cc: W. E. McCormick ✓
H. P. McMath

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