

Date December 13, 1966To Akron, Ohio
D/0020, B/5-H Attention Mr. W. E. McCormick From Welland Plant1 Letter 12/9/66 Subject _____cc: P. B. Mason
R. A. Woodrow
F. R. Hoddle

Thank you for your letter and the accompanying report by Mr. Modrell. We agree that further testing is necessary.

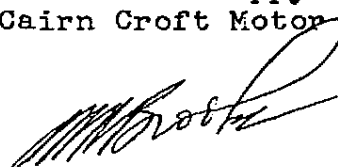
We were somewhat startled to see such high figures. As you may recall, the flame ionization meter readings averaged 33 ppm VCl in the polymerizers and 6 ppm on the floor. The tests conducted by Mr. Wahl of the Department of Labour averaged less than 50 ppm, supporting the flame ionization meter results. It would therefore seem advisable to conduct additional tests, preferably by an alternate method.

It has been observed generally that the readings tend to increase during the cleaning period due to VCl being liberated as the polymer is scraped loose. This is not the case with your readings as you have indicated, and it may be necessary to have more sophisticated testing prior to entry.

We trust that the test results from the other samples taken will be made available. We are particularly interested in the concentrations of other components.

December 28th should be satisfactory for Mr. Modrell's next visit. I expect personally to be on vacation; however, Mr. Julius Nagy will be able to provide all necessary assistance. The Customs broker that we use at the Peace Bridge is J. C. Wilson, but I am advised that it will not likely be necessary to contact them. A declaration of the instrument should be all that is necessary.

We will be happy to make reservations for Mr. Modrell at the Cairn Croft Motor Hotel.



D. A. Brooks
bd/

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12/9/66

I am enclosing a copy of the report of the studies Mr. Modrell recently made at your Plant in the polymerizers. The results that we found were considerably higher than we had hoped for and I do not believe will very well support our argument for the removal of the sentinels. We should make additional studies, as Mr. Modrell has suggested, in an attempt to try to determine the relationship of time of ventilation and quantity of air removed with respect to the vapor concentrations in polymerizers.

If agreeable with you, we would like to do this beginning December 28. Mr. Modrell will again come to your Plant and remain there for one or two days. This time he will have with him an instrument to bring into Canada and then return it to the States on his departure. We will prepare the necessary import papers here, but I would appreciate your advising me as to what broker he should see at the Peace Bridge. He will be driving into Canada the morning of December 28 and will cross at the Peace Bridge. He will need a room at the Cairn Craft Motel for the nights of December 28 and 29.

If for any reason these arrangements are not satisfactory with you, please advise me promptly and suggest an alternate time.

W.E. McCormick

cc: F.B. Mason
R.A. Woodrow
F.R. Hoddle

WEM/js

Enclosure

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BFG44851

Report of Visit to Welland, Ontario Plant
November 9 & 10, 1966

Several air samples were obtained in and around PVC polymerizers at the Welland Plant. Determination of vinyl chloride concentration in these samples was to serve as a basis for evaluation of personnel exposure during polycleaning operations.

I. Recommendations

- A. Perform additional sampling and evaluation of the atmosphere inside polymerizers, prior to and during cleaning. Determine relationship between exhaust time (ventilation rate) and vinyl chloride concentration in the polymerizer.
- B. Current practice of relying on a zero explosimeter reading before entering a polymerizer for cleaning does not afford an adequate measure of actual vinyl chloride concentration in the range of industrial hygiene concern. It is not recommended that the practice be discontinued at the present time, but as a final result of the current study a more reliable index will be developed to indicate time of safe entry into the polymerizers.

II. Results

The following table presents data on vinyl chloride concentrations at the various locations sampled. (Two additional samples not analyzed at the time of this report will be reported later.)

Vinyl Chloride Concentrations in
Polymerizers and Room Atmosphere

<u>Sample Description</u>	<u>Vinyl Chloride, ppm</u>	
	<u>Start of Cleaning</u>	<u>Midway Through Cleaning</u>
In large Poly No. 20 101EP-F21	124.	124.
In small Poly No. 16 101EP-F21	671.	205.
In large Poly No. 27 102EP-F1	208.	154.
In large Poly No. 22 401C3	205.	254.
In large Poly No. 3 121 (paste)	682.	116.
General Atmosphere - 2nd Floor		28.
General Atmosphere - 3rd Floor		56.

Significant concentrations of vinyl chloride were detected in all the polymerizers both before cleaning started and at a time approximately midway through the cleaning period. In two instances, at the start of cleaning (Polys Nos. 3 & 16), the recommended maximum allowable concentration

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of 500 ppm was exceeded. However, the second sample in these polys, taken after cleaning had progressed, showed vinyl chloride concentrations well below the recommended maximum of 500 ppm.

It would appear from these data that the initial time of entry into the polymerizers, following a period of ventilation, may present the most critical aspect of possible overexposure of personnel to vinyl chloride vapors. A more detailed investigation is necessary to relate time and rate of exhaust ventilation in the polymerizers to vinyl chloride concentration.

R.W. Modrell
Robert W. Modrell

RWM/ja

12/8/66

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2M.
Welland file
B. F. Goodrich Chemical Company

Inter-Organization Correspondence

To	<u>W. E. McCormick</u>	Date	November 29, 1966
Location	Akron	From	E. G. DeCapita EGD-51-66
Subject	Analysis of Atmospheres from Vinyl Polymerizers		

The atmospheric samples you obtained from polymerizers at the Welland, Ontario Plant were analysed by gas chromatography. Quantitative results for vinyl chloride in the atmospheres are tabulated in the attached Appendix. The analyses were made using a gas chromatograph equipped with a flame ionization detector. The results were quantitized by relating sample peak areas to a graph obtained by analyses of standard samples prepared in your laboratory. A cross-check will be made when a standard sample now being prepared by Air Products Company is received.

E. G. DeCapita

E. G. DeCapita

cc: R. J. Wolf
C. H. Lufter
Technical Council
C.T.F.
File (3)

dw

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Appendix I

Vinyl Chloride Content of Polymerizer Atmospheres

<u>Sample Identity</u>	<u>ppm Vinyl Chloride</u>
Poly Sample #1	124
Poly Sample #2	124
Poly Sample #3	208
Poly Sample #4	154
Poly Sample #6	671
Poly Sample #7	205
Poly Sample #9	205
Poly Sample #10	254
Poly Sample #11	682
Poly Sample #12	116
Atmosphere Sample #5	28
Atmosphere Sample #8	56

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Date November 25, 1966

To Akron Attention Mr. R. W. Modrell From Welland Plant

r Letter Subject

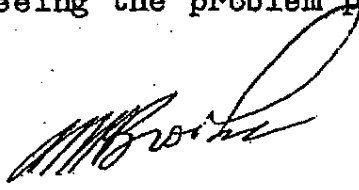
cc: J. Nagy

In reply to your letter of November 21st, the following is the information you requested.

1. The only calibrated volume we have on these vessels is the volume to the lip of the manhole. This is ¹⁵⁰~~5,800~~ and ⁴⁰⁵~~15,700~~ cu.ft. respectively. The volume including the top head is perhaps 5% in excess of these figures. 4.25 m³
11.46 m³
2. The capacity of the exhaust fan is 2,500 cfm. It is possible to have four exhaust hoses connected at once giving a minimum air flow of 625 cfm. 71 m³/
18 m³/
3. There is no stipulated exhaust time before a cleaner enters the poly, but rather the poly is exhausted until there is a zero reading on the explosimeter.
4. The average cleaning time, i.e., the time spent in the poly is 40 minutes for small polys and 60 to 75 minutes for large polys.

The air samples were mailed to Avon Lake on November 21st. We trust they have arrived safely.

We are looking forward to receiving the results of your tests and seeing the problem pushed to a successful conclusion.



D. A. Brooks
bd/

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November 21, 1966

Mr. D. A. Brooks
B.F. Goodrich Canada Limited
Welland, Ontario

Dear Mr. Brooks:

In my discussions with Mr. Nagy during the recent visit to your Plant, I neglected to make note of certain information for which we now have need. Specifically: (1) volume of the large and small polys, (2) exhaust rate, or airflow, through exhaust hose in poly, (3) recommended exhaust time before cleaner initially enters poly, (4) average cleaning time for large and small polys.

We have not yet completed our work on the samples but hope to do so shortly. In checking with Mr. DeCapata, at our Avon Lake Plant, I found that he had not received the two or three additional samples you were to mail him. Have these been delayed at the Plant or possibly held up enroute?

I wish to express my thanks, to both you and Mr. Nagy, for a pleasant and successful Plant visit. Your consideration is sincerely appreciated.

Very truly yours,

The B.F. Goodrich Company

R. W. Modrell
Department of Industrial
Hygiene and Toxicology

RWM/wlm

cc: W.E. McCormick ✓

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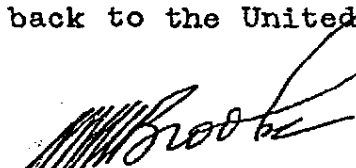
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Date October 28, 1966To Akron
D/0020, B/5H Attention W. E. McCormick From Welland Plantr Letter _____ Subject POLYMERIZER TESTINGcc: P. B. Mason
R. A. Woodrow

Thank you for your letter of October 24th setting out the date for starting polymerizer testing.

Reservations have been made for Mr. Modrell at the Cairn-Croft Motel, 2400 Lundy's Lane, Niagara Falls, Ontario for November 8th and 9th.

There are no advance preparations that we can make relative to bringing the test tubes through Canadian Customs. However, we do not feel that there will be a problem with a value of \$2.00. Mr. Modrell should simply tell the Customs official why he is entering Canada. If there is any problem, which we doubt very much, it will be in taking the samples back to the United States.



D. A. Brooks
bd/

P.S. - It has occurred to me that I am scheduled to be in Akron on November 9th. I have, therefore, advised Mr. Julius Nagy, our Safety Man, of Mr. Modrell's visit so that he may be of assistance to him. Mr. Modrell should ask for Mr. Nagy when he arrives.

DAB

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Welland, Ontario

David A. Brooks

Akron-D/0020-B/5-H

10/24/66

We are now prepared to proceed with the tests in the polymerizers that we discussed several weeks ago. If agreeable with you, I will have Mr. Robert W. Modrell, an Industrial Hygienist in my Department, be at your Plant the morning of November 9. It may be desirable for him to remain on the 10th. He will be driving and will arrive at Niagara Falls in the late afternoon of November 8. I would appreciate your arranging a room for him at Niagara Falls, Ontario, and advise me of the location.

He will be bringing with him for use at your Plant, approximately two dozen small rubber-stoppered test tubes, having a total value of about \$2.00. What procedure should he use in bringing these into Canada? He will be bringing them back here for analysis.

W.E. McCormick

cc: P.B. Mason
R.A. Woodrow

WEM/js

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Report of Visit to the Welland, Ontario Plant
September 1, 1966

I visited the Welland Plant for the purpose of evaluating manufacturing operations from the standpoint of industrial health hazards. I reviewed these operations with the Plant Manager, Mr. David A. Brooks. I found no uncontrolled existing health hazards. Plans were made with Mr. Brooks to return to the plant by November 1 and perform atmospheric studies inside of polymerizers for the purpose of obtaining proper data to present to the necessary provincial governmental personnel and, hopefully, obtaining a rescinding of the present standby orders for poly cleaners.

W. E. McCormick

WEH/cc

9-26-66

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9/15/66

I think I can explain the variance between Dr. Mastromatteo's comments to me regarding the permissible level for vinyl chloride and the statement that he made earlier this year.

The American Conference of Governmental Industrial Hygienists, of which Dr. Mastromatteo is an active member, had proposed, beginning in the Fall of 1965, that consideration be given to reducing the level from 500 ppm. The ACGIH is the group that establishes, on its own volition, threshold limit values each year at its annual meeting in May. Although these are values of a professional association only, in actual practice they have become, in many of our States and I suspect in your Provinces, official or quasi official standards. Primarily through the efforts of the AIHA and during my term as President of it, we were able to slightly modify the procedure for establishing these values so that ACGIH now circulates, usually in the Fall of the year, a list of values that it has under consideration to change and invites comments from professional industrial hygienists and toxicologists. While I have no access to any of the comments that were received on vinyl chloride, I do know that ACGIH decided at its May, 1966 meeting not to presently make any modification in the level. I feel sure that Dr. Mastromatteo's present position has been influenced by this decision, but I suspect that at the meeting that your personnel had with him earlier this year, he was persuaded that ACGIH would not effect a change.

We shall proceed with the tests in your polymerizers, as I have indicated, as soon as possible. I cannot promise definitely that we can do it before the first of November, but we will make every effort.

W.E. McCormick

cc: Dr. R.V. Yohe
P.B. Mason
R.A. Woodrow
F.R. Huddle

WEM/js

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9/6/66

Following my visit with you on September 1, I discussed the vinyl chloride question with Dr. Mastromatteo by 'phone. I had planned to personally meet with him sometime Saturday, September 3, but inasmuch as the weather turned quite rainy, I decided not to stay over in Toronto.

Dr. Mastromatteo feels that there is a good chance of our demonstrating safety in the polymerizers sufficient to obtain a rescinding of the stand-by order. He was very much in favor of the approach that I suggested--to develop considerable data on actual vapor concentrations in the polymerizers correlating this with ventilation, and from all of these data develop a specific proposal to the Ontario Department of Labor. He indicated that he personally feels that the present requirement is overly severe, but it will require some real spade work to have it rescinded. He also stated that the Province of Ontario has not reduced the permissible level of vinyl chloride for 8-hour exposure and that it still remains at 500 ppm.

Therefore, it is my recommendation to you that we proceed as you and I discussed. I will plan to have one of my personnel spend several days at your plant collecting the data. I would prefer to wait until about the first of November to do this, inasmuch as we are currently quite busy and it will also be necessary for us to obtain some instrumentation for the proposed measurements. If you are in agreement with this, please let me know immediately and we will make our plans accordingly.

W.E. McCormick

cc: R.V. Yobe
R.A. Woodrow
F.R. Hoddle

WEM/js

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Inside the reactors, in which the air was found by the other method to contain 22 to 68 ppm of vinyl chloride, one six minute simultaneous sample was taken with the Kitagawa Tubes at each location at which the five samples listed in the table were taken. In each case, the Kitagawa Tubes showed only a red stain approximately one-sixteenth of an inch long and no green stain was detected. These tubes do not appear to be sufficiently sensitive for a quick measurement of vinyl chloride in the concentrations found in the reactors in the present study.

"H. Wall"

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