

CONFIDENTIAL



DIVISION
CHEMICALS & PLASTICS

DELIVER THIS LETTER TO	ADDRESS REPLY TO
Mr. H. L. Watson	Mr. J. T. Barr
At Calvert City	At Calvert City

Date May 8, 1969

SUBJECT: MCA MEETING
 WASHINGTON, D.C.
 MAY 6, 1969

Replying to
 your letter dated _____

SUMMARY

Representatives of the companies manufacturing PVC who sponsored the recent study at the Institute of Industrial Health, University of Michigan, through the Occupational Health Committee of the MCA, received a report of the Michigan group with extensive discussions and received the recommendations of the Occupational Health Committee, who had additional comments. It was agreed that this latter committee would present a set of formal recommendations to the sponsors and call another meeting at which action will be taken on the continuing program. The central findings were that exposure to vinyl chloride monomer vapors and, more importantly, exposure of workers during reactor cleaning procedures must be sharply reduced.

REPORT

The occupational disease Acroosteolysis (AOL) is a disease peculiar to the PVC industry and has been recognized only in the past few years. It is evidenced primarily by Renaults Phenomenon (RP) which is a sudden whiteness of the skin of the hands in the presence of cold and by degenerative processes in the phalanges of the fingers which are characterized by external tenderness and may be seen with some difficulty on X-ray photographs. There is a small normal incidence of RP in any general population but the presence of both these symptoms is an indication of AOL. As a result of this cooperative study the disease has been found to be more widespread than originally thought, and there is growing evidence that in chronic cases involvement of other bones, such as the back and skull, can develop. It is known to be prevalent in the United States and Europe. There is an unconfirmed report that some Spanish workers who wear only sandals have developed involvement in the feet. It is easily arrested and to some degree cured by removal from the environment which caused it.

AP00002185

May 8, 1969

Re: MCA MEETING, WASHINGTON, D.C., MAY 6, 1969

The evidence is overwhelming that the procedure of hand scraping reactors is a primary cause of the disease. Twenty-four of the twenty-five active cases discovered in this study had work histories including reactor cleaning in commercial plants. The twenty-fifth case had worked in a laboratory and he thought he remembered having cleaned laboratory reactors. The nature of the causative agent is unknown and Goodrich and others have made efforts to discover an agent in reactor scrapings without success. The feeling was expressed repeatedly at the meeting that there was a short-lived material present in a recently opened reactor which was the principal agent. Further studies will be recommended in this direction.

The small number of active cases relative to the number of persons exposed leads to the feeling that there was an individual susceptibility involved in the disease. Several expressed the hope that it would be possible to make some prior determination of this susceptibility for use as a screening test for workers to be assigned in this area. At this date, however, no such test is known.

The members of the Michigan team emphasized the fact that those plants which did not now have examples of the disease should not decrease their degree of surveillance in the future. All of the cases which fall into the diagnostic groups 3 and 4 are at least potential if not early stages of the disease. We had reported to us three cases in Group 3 and one in Group 4. The one case in Group 4 had a short history as an Area 6 utility man. One case in Group 3 had worked in Areas 2, 5, and 7, one in the storeroom, and one in maintenance.

On the basis of the relatively small population sample, compounding operations appear to be clear of any danger of the disease, which by inference means that the finished product itself carries no potential danger.

One factor which seemed of considerable importance to the people at Michigan was the fact that all plants which reported the disease scraped every reactor after every batch, while a large portion of those plants which reported no disease followed procedures similar to those we have here. Their very careful statistical analyses of occupational histories lead them to conclude that there was no danger in contact with the material after it left the reactor. Slurry handlers, baggers, compounders, etc., who had evidence of contact with aged resin showed practically no incidence of the disease unless they had had earlier experience as reactor cleaners.

May 8, 1969

Re: MCA MEETING, WASHINGTON, D.C., MAY 6, 1969

The contract with the University of Michigan gives them permission to publish the results of this study. A partial presentation was made about two weeks ago to a public health group at Dallas, and another presentation will be made next week to a group of industrial hygienists in Denver. They have agreed that the report as we received it will not be published, but they will continue to issue publications and they will continue to do further analyses of the data which they have. Thus, the basic information on the subject will become general knowledge.

It was agreed by all present that there must be a continuing effort in this field and that this must include at least three phases. The first of these, of course, is to continue to follow the histories of those who now have AOL and study the progress of the disease. The second phase is to continue surveillance of those suspect cases and of all other workers in the area of reactor cleaning or other areas of high monomer exposure. The third phase should be an attempt to discover the cause of the disease and may include an analysis of the scrapings, animal studies, and further data analyses.

The Occupational Health Committee suggested some changes in the recommendations of the Michigan report. In Recommendation 1 they wished to avoid the implication of a 50 ppm maximum allowable concentration of vinyl chloride vapor and suggested a rewording which states that a 50 ppm level is useful as an index of adequate ventilation in a purged reactor. In Recommendation 3 they wish to change the word "continued" to "supported", because there is at present no animal study but there should be. They also wish to add the following recommendations:

1. There should be a pre-assignment examination of workers in this area which would include hand X-rays and medical histories.
2. There should be a periodic surveillance with a frequency of at least once a year of workers in this field which also would include X-rays and histories.
3. Manufacturers of PVC and vinyl chloride should consider sponsoring further studies to determine the causative agent.
4. Hand scraping of reactors should be eliminated.

Mr. Watson

- 4 -

May 8, 1969

Re: MCA MEETING, WASHINGTON, D.C., MAY 6, 1969

The sponsors charged the Occupational Health Committee with preparing a formal proposal for a continuing program on this problem. The representative of Goodrich stated that they would be glad to work directly with the other companies who had active cases and asked the other companies to identify themselves. Only Pantasote did so, and said that they were Corporation 21 with Plants EE and DD.

RECOMMENDATIONS

There was considerable discussion at the meeting concerning using high-pressure jets for reactor cleaning. There were also reports of death from misuse of this equipment. I do not believe that we should exchange the possibility of a relatively minor hand condition for the greater possibility of severe injury or death. I therefore suggest that we put into operation a system for opening and flushing the homopolymer reactors after each batch with a low-pressure jet. This will not eliminate the necessity for eventually entering the reactor, but it will decrease the frequency and the length of stay. Based on past experience we should not have to hand clean a reactor more than every eight to ten batches and then only remove the large accumulations on the baffle and thermowell. I suspect that we will at least break even and possibly show an economic advantage for this method over our present one. It will involve capital expenditures for a vacuum system and manhole protector rings. It should not be necessary on the copolymer line because our present boilout system should be adequate protection for workers who enter the reactor later.

I also recommend that we alter the purging system for reactors so that the vapors are conducted outside of the building rather than blown into the operating space.



J. T. Barr

JTB:pg

cc: R. T. Lund
J. M. Tinnon

AP00002188