

## INTEROFFICE CORRESPONDENCE

DP

DATE December 21, 1972

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Industrial Hygiene Survey  
E. R. #34-72  
Mobil Chemical Company  
Kankakee, Ill.  
November 16 - 17, 1972

The attached report presents the findings of the industrial hygiene survey performed at your plant on November 16 - 17, 1972, by Lester Levin, Eastern Regional Industrial Hygienist.

It would appear that employee exposure to asbestos fibers from paint mixing operations are well below the allowable OSHA limit as a result of proper work handling techniques and environmental controls, notably the new ventilation system. We do have some recommendations for improvements in the overhead canopy hoods and for better housekeeping in the raw material storage area. If a suitable non-asbestos containing talc were available, it would be desirable, though not necessary, to substitute.

A repeat noise survey indicates that employee exposure is also well within the allowable OSHA limits although the wearing of hearing protective equipment in the ball mill area should be encouraged for those employees who might be in the area for a significant period of time, i.e. greater than 15 minutes.

Should you have any questions about this report or require any additional assistance or information, please feel free to contact this office.

G. B. Meyers, M.D.  
Regional Medical Director

LLevin:smh  
Attachment

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MOBIL OIL CORPORATION  
Eastern Region Medical Department  
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Hygiene and Toxicology

E. R. #34-72  
November 1972

INDUSTRIAL HYGIENE SURVEY  
MOBIL CHEMICAL COMPANY  
KANKAKEE, ILL.

Report by: Lester Levin Approved by: [Signature]

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## I INTRODUCTION

A special environmental health study at the Kankakee Chemical Coatings Plant was performed on November 16, 1972, to evaluate the new ventilation system and the exposure of employees during the use and storage of asbestos-containing talc. In addition, noise level measurements were repeated in the ball mill operation to evaluate current employee exposure to noise in these areas. The evaluation of the asbestos exposure was particularly significant in view of the more restrictive measures recently established by the U. S. Department of Labor under the health and safety regulations of the Occupational Safety & Health Act of 1970 (OSHA).

## II SUMMARY & CONCLUSIONS

1. Based on personal air monitors, employee exposure to airborne asbestos fibers during representative paint mixing operations employing asbestos-containing talc is well below the allowable threshold limit value.
2. Similarly,, atmospheric concentrations of asbestos fibers both in the work environment and in the basement storage area are within allowable limits.
3. The storage and housekeeping of the talc material requires better control - e. g. broken bags should be promptly enclosed in heavy duty plastic bags to prevent dispersion of the asbestos fibers. Segregation of the talc in a small area should be considered.
4. The new plant ventilation system appears to be functioning according to design; however, improvements in the capture efficiency of the overhead hood above the mixing containers are recommended. In some cases, the old ventilating system is still operating in competition with the new system and should be removed.
5. With the maximum number of ball mills operating, the allowable noise exposure for employees without hearing protection would be about four hours per day. Based upon our observations and reports from the foremen, employee exposure would not exceed two to three hours per day. However, we would recommend that workers remaining in the area should be provided with and encouraged to wear hearing protective equipment.
6. The noise levels produced by the small pebble mills on the third floor are well below the allowable limit for full-time exposure and would, therefore, present no hearing damage risk to the workers.

## III INDUSTRIAL HYGIENE SURVEY

### A. Asbestos Exposure

#### 1. Methods and Procedure

The evaluation of exposure to asbestos fibers is based upon both personal monitoring and environmental or area monitoring. In the first case, a 25 millimeter

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membrane filter (Millipore, Type AA) of 0.8 micrometer porosity was placed on an open-faced filter holder and attached to the collar of the workman. The air sample was taken at a sampling rate of approximately 1 liter per minute with a battery-operated pump (Mine Safety Appliance Monitaire Pump) which was attached to the employee's belt. The personal air sample was taken throughout the time employee was adding and mixing the talc for periods of from 10 to 18 minutes.

Concurrently with the personal air monitoring, environmental air sampling was performed in the nearby work area using a 47 millimeter membrane filter (also Millipore, Type AA) at a sampling rate of about 2 liters per minute.

An area sample was also taken in the basement raw material storage area.

The membrane filters were sent to an outside laboratory (Trapelo) for microscopic counting by phase contrast illumination as prescribed by the OSHA health and safety regulations covering asbestos (paragraph 1910.93 a).

#### B. Results & Discussion

The results of the air sampled are shown in Table 1 below:

AIRBORNE ASBESTOS CONCENTRATION

| <u>ID</u> | <u>Sample Location</u>                                                                                                | <u>Sampling Time Mins.</u> | <u>Asbestos fibers<br/>per ml of air</u> |
|-----------|-----------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|
| K-1       | Basement Storage Area                                                                                                 | 31                         | 0.7                                      |
| K-2       | Manufacture of Valchen<br>water epoxy-Personal Monitor                                                                | 13                         | 2.5                                      |
| K-3       | Manufacture of Valchen<br>water epoxy-Area Monitor<br>within 4' 65 mixing vat at<br>breathing level                   | 18                         | 0.3                                      |
| K-5       | Manufacture of Product<br>1502-04 Hole Color-Area<br>Monitor - Based on scale<br>approximately 5' from vat<br>opening | 10                         | 1.9                                      |
| K-4       | Manufacture of Product<br>1502-04 Hole Color-Personal<br>Monitor                                                      | 10                         | 4.1                                      |

Current OSHA TLV (8 hour time weighted average)

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Count shall not exceed five (5) fibers as time-weighted average or 10 at any given time.

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The personal monitors represent the maximum i. e. actual exposure time, of the workers. It is apparent that both this exposure and the concentration in the immediate environment are well below the allowable eight hour time-weighted daily average. OSHA regulations also limit exposure to a maximum concentration of ten fibers per cc of air for any given period of time, irrespective of time-weighting. We would conclude from the air sampling survey that the exposure of the Kankakee personnel to asbestos fibers during paint manufacturing is well within the present allowable limits.

Note: A similar study of asbestos exposure during paint manufacturing was performed in the Edison, New Jersey Chemical Coatings Plant and indicated essentially the same levels of exposure.

#### Basement Storage Area

The air sample in the basement storage area was taken when no employees were active in the area so that the airborne concentration represents a true background level.

Although the airborne concentration of asbestos fibers in this largely unoccupied area is well below the allowable time-weighted average of five fibers per ml, the fact that some asbestos fibers are present in the air is an indication that the asbestos was not properly contained. Some of the bags containing the talc (see materials 101, 102, 107, 108) had been ~~broken~~ open so that material spilled out and small quantities of the asbestos presumably became airborne. We would recommend that if the bag or container of the talc or asbestos-containing material is broken, it should be promptly repackaged or enclosed in a durable and impermeable bag or other closed container. For purposes of control, it may be advisable to store all the asbestos-containing material together or in a segregated area of the warehouse.

#### B. Ventilation System

The capture velocities at the face of the overhead hoods or flexible exhaust hoses were measured with an Anor Velometer. Spot checks indicated that the ~~new~~ ventilation system provides more than the minimum capture velocity, e.g. most readings were greater than 500 fpm. However, the overhead hood above the Hockmeyer mixing vat should be extended so that it encompasses the widest mixing vat used. At the present time, when the hood is lowered as close to the vat as possible, it covers only about 1/2 to 2/3 of the mixing vat ~~should be~~. Consequently, solvent vapors and even some dust might not be completely captured by this arrangement.

At the particular units sampled, the old ventilating system was also still being used. Thus, a flexible duct from the old system was exhausting air in competition with the newly designed canopy and should be dismantled. You may wish to consider incorporating the blowers from the old system into the present system to add increased exhaust rates; however, this does not seem to be necessary based on our velometer readings and the blowers could also be removed.

We also pointed out that the stirrers from some of the mixing vats were off-center so that the two semi-circular cover plates could not be closed for optimum containment. These plates should be refabricated, preferably with a hatch cover for introduction of the raw materials.

### C. Noise Survey

#### 1. Method

The noise measurements were made with a General Radio, type 1565-A Sound Level meter which was calibrated acoustically just prior to the measurements. The measurements in decibels were taken on the A-scale, which preferentially records the noise level in the speech frequencies and is the scale used by OSHA to define permissible noise limits. Readings were made on the second floor ball mill area when the most probable number of ball mills were operating and also on the third floor pebble mill area.

The degree of employee exposure, i.e. the relative amount of time the workers spend in the area was also noted.

#### 2. Results and Discussion

Results of the noise survey are shown in the table below.

#### NOISE SURVEY

| <u>Location</u>          | <u>Conditions</u>     | <u>Sound Level,<br/>A-scale, decibels</u> |
|--------------------------|-----------------------|-------------------------------------------|
| 2nd floor Ball Mill Area | 4 - 5 units operating | 91.5 - 93                                 |
| Range                    | 6 units operating     | 92.0 - 95                                 |
| Center of area           | 6 units operating     | 95                                        |
| Average ambient reading  |                       | 93                                        |
| 3rd floor - Pebble Mills | 1 mill on, loaded     | 81                                        |
|                          | 1 mill on, dry        | 95                                        |

#### OSHA PERMISSIBLE NOISE EXPOSURES

| <u>Duration per day,<br/>hours</u> | <u>Sound Level, A-scale<br/>in decibels</u> |
|------------------------------------|---------------------------------------------|
| 8                                  | 90                                          |
| 6                                  | 92                                          |
| 4                                  | 95                                          |
| 3                                  | 97                                          |
| 2                                  | 100                                         |
| 1                                  | 105                                         |

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According to the OSHA noise criteria, ball mill employees may be exposed to the average ambient noise level of 93 dB(A) for about 5 hours a day, day after day without requiring hearing protection. During the entire time of our survey, we did not observe any workers remaining in the work area despite the fact that 5 mills were operating. The former estimate that the workers would not actually be in the work area more than a maximum of 2 to 3 hours on any given day. Therefore, based on present OSHA criteria, the plant workers are not exposed to excessive levels of noise. The noise level by the pebble mill area when fully loaded and operating is only 81 dB(A) which is well below the allowable limit for full time, i.e. 8 hours per day, day after day exposure.

Although we conclude that the exposure to employees on the 2nd floor ball mill area is within allowable limits, the level is sufficiently high to warrant encouraging employees to wear hearing protectors if they are in the area for any significant period of time, i.e. more than 15 minutes at a time. Our reasons are that high level noise, i.e. above 85 dB(A) is capable of producing hearing damage with some individuals and therefore it would be good work and safety practice to promote an ear protector of the employee's choice when working in the area. Secondly, it is likely that OSHA will ultimately lower the allowable noise levels to assure greater protection for the reason cited. Consequently, we would serve both the employees' and the Company's best interests with this preventive approach.

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