GMF-4CC REV. 7-68 3-65

INDUSTRIAL HYGIENE VISIT

CYANAMID

CENTRAL MEDICAL DEPARTMENT
ENVIRONMENTAL HEALTH SECTION

| LOCATION | HYGIENIST (S) | REPORT NO. |
|---|---|---|
| MacGregor Lead - Chicago | W. V. Andresen | 71-54 |
| | | DATE OF VISIT (S) 6/22-25/71 |
| | REPORTED BY W. V. Andresen | DATE OF REPORT 6/29/71 |

| PURPOSE | COPIES |
|---|---|
| 1. Review Operations for Exposure to Lead<br>2. Review Operations for Safety and Industrial Hygiene Problems | cc: Dr. W. N. Norley - NA<br>Mr. R. Biel - MacGregor<br>Mr. W. T. Ries - BB<br>Mr. J. A. Schmidlein - BB<br>Mr. T. P. Turchan - NA |

The MacGregor Lead operation was visited during the period of June 22 to 25 to review all operations with respect to potential employee exposure to lead salts and to other industrial hygiene and safety problems. The cooperation of Mr. C. Dadko during the visit is appreciated.

## RECOMMENDATIONS

1. Start a respirator clean-up program per Safety Standard S-27 (attached).
2. Provide each worker with two lockers, one for clean clothes and the second for work clothes.
3. Discontinue storage of food, beverages, coffee cups, silverware, etc., in lockers, and eating in locker room.
4. Require laboratory personnel to follow the same personal hygiene practices as the plant operators. Discontinue making coffee and eating in the laboratory.
5. Provide a new lunchroom. Replace existing lunchroom table top with a dark Formica one.
6. Provide paper jackets or laboratory coats to cover dirty uniforms when eating and wash face and hands before eating. As an alternative vacuum clothing, roll up sleeves and wash hands, face, and arms before eating.
7. Clean dust from overhead pipes, walls, etc. by vacuum periodically.
8. Installation of ventilation improvements per the Industrial Hygiene Visit text.
9. Review all plant operations with reference to Occupational Safety and Health Administration standards. See survey text for comments.

10. Improve acetic acid handling, basic white lead. Post area per survey text. Provide operator with safety goggles--Cyanamid Safety Standards S-8, Eye Protection (attached).

11. Post sulfuric acid area per survey text. Provide operators with safety goggles. Require their use as well as gloves.

12. Improve storage of raw materials and packaging materials in the warehouse. Provide lift truck with overhead guard.

Mr. John J. Clark, Glendale Optical Company, Miswest Regional Sales Manager, was contacted on arrival and arrangements were made to obtain Glendale respirators approved by the U.S. Bureau of Mines for protection against lead dust and fumes. Mr. Clark delivered the respirators the same morning and they were immediately distributed to the operators. The proper utilization and care of the respirator was explained to each operator. It was recommended to Mr. Dadko that the cleaning method in the Cyanamid Safety Respirator standard be followed. Copies of the standard are attached.

Personal hygiene practices were reviewed. The employees are provided with coveralls or shirt and pants, two changes per week. Each employee has one locker and inspection showed that work clothes as well as street clothes, coffee cups and food were stored in these lockers. It is recommended that each worker be provided with two lockers, one for work clothes and the second for street clothes. The storage of coffee cups and food must be discontinued. The storage of food is prohibited in the OSHA Standard, Subpart J, General Environmental Controls 1910.141, Sanitation of Lunchrooms--which stipulates that no food shall be stored or eaten where there are present any toxic materials or substances that may be injurious to health.

Employees are required to shower at the end of the work day. This is supervised. Laboratory personnel spend considerable time in the work area and work with lead materials in the laboratory. They should also be required to wear work clothing and shower and change into clean clothing at the end of the work day. Coffee is made and lunches are eaten in the laboratories. These poor practices are also in violation of Subpart J, General Environmental Control 1910.141 Sanitation of Lunchrooms. It is recommended that the making of coffee and eating lunches in the laboratory be stopped immediately.

The operators take coffee breaks and eat lunch in work clothes which may be grossly contaminated with lead salts. Particles of lead salts were found on the lunchroom table. Ideally the workers should wash and change clothes before eating. It is realized that this is difficult to do with a half hour lunch period. Mr. Dadko's suggestion to have the workers don paper jackets or lab coats prior to eating is worth a trial and wash hands and face. As an alternative, the clothing should be carefully vacuumed, sleeves rolled up and hands, face, and arms thoroughly washed prior to eating. The lunch table is in a state of disrepair. As mentioned above, lead particles were found on the table. Mr. Dadko was planning to replace the table top with one of white Formica. It was recommended that a dark colored Formica be used instead of white as many of the lead salts are white in color and contamination would be recognized more easily on dark Formica. A check of the lunchroom showed the presence of dust containing lead on pipes, doors and other surfaces. The lunchroom

Description and Reasons Required

This capital order estimated to cost.....$8,000 provides facilities to improve industrial hygiene and safety at the newly acquired MacGregor Plant as recommended in the attached Industrial Hygiene Survey.

The MacGregor Plant manufactures lead compounds which are sold as plastic additives, pigment for paint and various other uses. Protection of employees from ingestion of lead is a critical part of this operation and the facilities to be provided on this order are primarily designed to improve this protection.

These facilities include additional ventilating ductwork around various pieces of equipment, a new lunchroom with fresh air supply, 25 new lockers to provide each man with two lockers (one for work clothes and one for street clothes) and an overhead guard for a lift truck which is a safety item.

Products manufactured by MacGregor are primarily plastic additives which are a Quadrant 1 business.

MacGregor was acquired on June 1, 1971. Estimated sales and profit on sales for the second half of 1971 are shown below

| | |
|---|---|
| Est. sales last half 1971 | $1,228,000 |
| Profit on Sales | $ 364,702 |
| % P.O.S. | 29.7 |

is under positive pressure to the work area outside, but is adjacent to the locker room where contaminated clothing is stored, removed, etc. There is a high probability of contamination and a new lunchroom segregated from the locker room and lead work areas is recommended. The lunchroom could be conveniently located in a corner of the warehouse and this is recommended. The Coca Cola cooler should be located in the new lunchroom. A number of employees were eating in the locker rooms. This was discontinued immediately.

Housekeeping at operating level was good. The operators clean up spillage as it occurs. There is, however, dust on overhead pipes, walls, etc., which should be periodically vacuumed.

Atmospheric sampling for lead in air was performed using a Mine Safety Applicance Lead in Air Test Kit. The kit was left at the plant and it is suggested that periodic tests be made of the workroom atmosphere. The air testing showed a number of areas where lead concentrations in the atmosphere were above the Threshold Limit Value of 0.2 mg/cubic meter. Some of these were intermittent excursions above the TLV, others relatively continuous emissions. The sampling results are noted in the industrial hygiene and safety reviews of the individual operations which follow and also in Table I.

Ball Mill Operation

Lead pigs are cut and ball milled at high temperature to form oxide. The operator wears safety shoes and is provided with metatarsal guards which he is required to wear.

The steps to the platform at the lead feed do not comply with Subpart D, Walking-Working Surfaces, 1910.24, Fixed Industrial Stairs, of the Occupational Safety and Health Administration Standards. Stair replacement is recommended.

Many of the signs used to promote health and safety are in violation with Subpart J, General Environmental Controls 1910.145, Specifications for Accident Prevention Signs and Tags. All new signs or replacements must be in accordance with the specifications after July 1, 1971.

It is planned to make a noise survey in this area on the next visit.

Atmospheric sampling in the ball mill area on Wednesday, June 23, 1971, showed levels slightly in excess of the Threshold Limit Value of 0.2 mg/$m^3$. A review of operations showed some covers on screw conveyors to be loose. These were tightened and the next day general workroom levels were below 0.2 mg/$m^3$. Tote boxes of litharge are filled to be used in making lead sulfate. When this was being done, levels over 0.8 mg/$m^3$ were measured. Better ventilation is required for dust control and the installation of a larger duct is recommended. This was reviewed with the local sheet metal contractor who is estimating cost. Installation is recommended as soon as possible.

Although not tested, the reworking of dust from the litharge kiln is probably dusty. Mr. Dadko is to check this and if necessary, ventilation will be provided.

Litharge Kiln

Fine material from the ball mills is converted to litharge in rotary kilns. Ventilation is provided for the kiln and ancillary equipment and dust control is good under normal operation. It is, however, necessary to frequently remove large pieces of material from the kiln and during this operation dust is liberated during removal operation and from the kiln at the firing end. Atmospheric concentrations in excess of 0.8 mg/m$^3$ were measured during removal of large pieces. Improved ventilation is required. A hood design was sketched for the container into which the large particles are discharged. The design was discussed with the sheet metal man who is to estimate the cost. Installation is recommended as soon as possible.

There is a ventilated hood over the firing end of the kiln, but it is ineffective when the door is opened to remove large particles. Concentration in air on a spot sample were over 0.8 mg/m$^3$. It is recommended that fire proof curtains be immediately installed to reduce the hood open area. This was discussed with Mr. Dadko.

White Lead (Basic Lead Carbonate)

White lead is made by reacting litharge in water and acetic acid with carbon dioxide. The litharge is charged from a weight hopper into the reaction tank. The operation was not observed but is probably dusty. Dust control is recommended and was discussed with Mr. Dadko.

The stairs to the reaction tank do not comply with the specifications of Subpart D, Walking-Working Surfaces, 1910.24, Fixed Industrial Stairs. Replacement is recommended.

The present method of charging acetic acid into open top buckets and carrying them up the stair to dump into the kettle is unsatisfactory from a safety and health standpoint. It is recommended that the handling method be improved to eliminate the handling of open buckets. The utilization of a pump or gravity charging system is suggested. Operators handling acetic acid should be required to use eye protection (splashproof goggles - Safety Standard S-8, Eye Protection). The area should be posted with a CAUTION - WEAR GOGGLES sign.

No problems were observed in the drying and bagging operations.

Lead Sulfate

This product is made by reacting litharge with sulfuric acid in a Day Mixer and drying the resulting slurry in a P & S dryer. The charging of litharge from a tote box is dusty. During charging, concentrations of lead in the operator's breathing zone were in excess of 0.8 mg/m$^3$. It is recommended that the tote box be covered and ventilated. A design was discussed with Mr. Dadko and the sheet metal contractor who is to estimate the cost. Installation as soon as possible is recommended.

The sulfuric acid tank should be posted - CAUTION - SULFURIC ACID - WEAR GOGGLES - and the operator should be required to wear splashproof goggles when charging acid and water, or when in the area of the tank.

The stairs to the Day Mixer platform and dryer platform do not comply with Subpart D, Walking-Working Surfaces, 1910.24, Fixed Industrial Stairs, of the OSHA Standard. Compliance with the Standards is recommended.

Dust escapes from the bagging operation, especially at the make-up drum. A hood enclosure and ventilation is recommended. Lead in air concentrations in the operator's breathing zone were 0.8 mg/m$^3$. The design was reviewed with the sheet metal contractor who is to estimate the cost. Installation is recommended as soon as is possible. A higher receptacle is recommended for catching dust spillage from bagging operations.

Stabilizer Manufacture

This product blends white lead, calcium stearate, and atomite. Raw materials charging and blending operations are satisfactory. Dust escapes to the workroom when bagging and adjusting bag weights. Air sampling showed concentrations in excess of 0.8 mg/m$^3$. A hood enclosure is recommended for the make-up drum plus additional ventilation at the bagger. This was discussed with the sheet metal contractor. Installation as soon as is possible is recommended. A large receptacle is recommended for dust spillage.

Warehouse

Lead in air concentrations in the warehouse are below the Threshold Limit Value.

Many packaging materials and finished products are stored so they lean from the vertical and present a potential safety hazard. Improvement in storage practice is recommended. Subpart N, Materials Handling and Storage 1910.178, Powered Industrial Trucks and Safety Guards--specifies the High Lift Rider trucks shall be fitted with an overhead guard. This is recommended.

Maintenance Operators

It was not possible to review the maintenance operations in detail. However, inspection of the maintenance area indicates that there probably are violations of the new OSHA standards with respect to Subpart O, Machinery and Machine Guarding, and Subpart Q, Welding, Cutting and Bronzing. It is recommended that these sections be read and compared with operations at the plant.

W. V. Andresen

WVA:lv

## TABLE I

## LEAD IN AIR SAMPLING

| Sample Number | Location | Concentration $mg/m^3$ |
|---|---|---|
| 1 OBZ | White Lead Bagging | Less than .2 (Approx. 0.1) |
| 2 OBZ | White Lead Bagging | " " " " " |
| 3 OBZ | Ball Mill (Loading Platform) | Over .2 - Approx. 0.3 |
| 4 OBZ | Ball Mill (General Work Area) | Over .2 |
| 5 OBZ | Litharge Kiln (During Large Material Removal) | 0.8 |
| 6 OBZ | Litharge Kiln (After Large Material Removal) 10 min. | 0.3 |
| 7 OBZ | Ball Mill Area (After Tightening Conveyor Covers) | Less than 0.2 |
| 8 Upwind, Back of Operator | Lead Sulfate Bagging | Less than 0.2 |
| 9 OBZ | Lead Sulfate (Litharge Charge) | Over 0.8, probably 1.5-2.0 |
| 10 OBZ | Lead Sulfate OBZ Bagging | Approx. 0.8 |
| 11 OBZ | Lead Sulfate (Litharge Charge After Charge) | Negligible |
| 12 Spot Sample | Lead Sulfate (Dryer Discharge) | Approx. 0.2 |
| 13 OBZ | White Lead (Rework) | Less than 0.2 |
| 14 OBZ | Ball Mill Area (Loading Tote Box) | Over 0.8 |
| 15 Spot Sample | Litharge Kiln Hood (Outside Hood During Material Removal) | Over 0.8 |
| 16 OBZ | Litharge Kiln Operation (During Large Material Removal) | Over 0.8 |
| 17 OBZ | Bagger Stabilizer | Over 0.2 |
| 18 OBZ | Ball Mill Area (Loading Platform) | Negligible |
| 19 Spot Sample | Litharge Kiln Hood (Bottom Door Closed) | Below 0.2 |
| 20 Spot Sample | Lead Sulfate Discharge P & S Dryer to Elevator | Over 0.8 |
| 21 OBZ | Office | Negligible |
| 22 Spot Sample | Lead Sulfate P & S Dryer Discharge | Over 0.8 |
| 23 OBZ | Warehouse | Negligible |
| 24 OBZ | Litharge Kiln Area | Slightly Over 0.2 |
| 25 OBZ | Cleaning Front End of Kiln | Over 0.8 |

OC-721-1063
5/65

# DETAIL SHEET



| SHEET NO. | JOB ORDER NO. | DATE |
|---|---|---|
| 1 | OC 5098 | ~~XX/XX/XX~~ 7/15/71 |

| COMPANY | LOCATION |
|---|---|
| Organic Chemicals Division | MacGregor Plant, Chicago, Ill. |

| ITEM OR CODE NO. | DESCRIPTION | EQUIPMENT OR MATERIALS | LABOR | TOTAL | |
|---|---|---|---|---|---|
| 1 | New lunchroom | | | $4,500 — | $6,300 |
| 2 | New lunchroom air conditioner | | | 500 — | |
| 3 | Additional plant ductwork | | | 1,800 — | 1500 |
| 4 | 25 additional lockers | | | 500 — | |
| 5 | Overhead Guard for Lift Truck | | | 200 — | |
| 6 | Contingencies | | | 500 | |
| | Total | | | $8,000 | |