FILE - Survey - Env. Hygiene

FORM OM-10001 REV. 961

INTER OFFICE MEMO **Olin**

TO Kendell Potter AT Miami, Florida DATE April 27, 1971

FROM Henry J. Muranko AT New Haven, Conn. COPY TO Mac Roy Gasque, M.D.
B. W. Smith
W. W. Sears

SUBJECT Environmental Hygiene Survey -
Vanite Plastics, Miami, Florida.

On March 22, 1971 a plant visit was made to Olin Vanite Plastics in Miami, Florida for the purposes of conducting a ventilation survey in the batch blending department and initiating an environmental hygiene survey in the plant. Assisting in this study was Mr. Frank Fonseca, Jr., Plant Engineer at Olin Vanite Plastics. The cooperation and assistance extended during this survey was gratefully appreciated.

Conclusions and Recommendations

The following section summarizes the text of this report.

1. The weighing operator in the Blending Department is being exposed to excessive concentrations of nuisance dust and possibly lead dust. Appropriate local exhaust ventilation should be installed to protect the operator during the transferring of batch material. See Appendix A.

2. Until exhaust ventilation can be installed, the operators in the Blending Department should be provided with particulate filter respirators. See Appendix B.

3. Blood and urine samples for lead determination should be taken from the Blending Department operators by your clinic for analysis by our Environmental Hygiene Laboratory.

4. Safety glasses should be worn in the Blending Department.

5. An eyewash fountain should be installed in the Blending Department.

6. Certain design modification on the Helix Blender and Cooler will significantly reduce dust concentrations in the blend operator's area. Covers on the loading ports and a lid on the batch dump bin are recommended.

7. A periodic scheduling of maintenance on the wall ventilators in this department is suggested.

8. Serious injury may result if a container falls from the open pallet used to transfer cans to the blend level. It is recommended that the pallet be enclosed.

9. Accumulations of settled dust were observed over most of the Blending Department. Improved housekeeping would help reduce the general dustiness in this area.

OLI 4636

10. Noise levels at the injection molding grinders, while excessive in operation, are presently within acceptable limits on a time weighted basis. It should be noted that relatively straightforward noise reduction methods exist for this type of machinery. See Appendix C.

11. The primary grinding operation averages 97 dB-A during most of an eight-hour shift. This operation should be provided with an acoustical enclosure. An effective hearing conservation program is recommended. See Appendix C for enclosure details.

Description of Operation

The plant employs approximately 100 people in the production of polyvinyl chloride pipe and pipe fittings. The plastic pipe is formed by four extruding machines and the various pipe fittings are manufactured on five injection molding machines. Generally, each type of pipe produced (e.g., electrical pipe, pressure pipe, communication conduit, drain and vent pipe, and sewer pipe) has specific batch ingredient requirements. The batch mixing is conducted at the plant. Further processing, such as threading, belling, or the attachment of couplings to the products, is carried out at the plant.

Batch Blending Department

Two operators are responsible for the preparation of the batches. One man hand transfers most of the ingredients from barrels or bags to small plastic containers that he then weighs and adjusts to the required quantity. Approximately eight such transfers are made per batch, and approximately sixty-three batches per each of the first two shifts are prepared (material for the third shift is prepared on the first and second shifts). The weighed material is then transferred in batch lots by pallet and forklift to the blend operator's position located on a platform about 15 feet above the weighing area. The blend operator is responsible for hand feeding the weighed materials into the blending tank or the cooling tank at the proper time.

Detailed Recommendations - Batch Blending

1. A large amount of air is moved through the batch blending building by four general room ventilators located about 20 feet above the floor on the west wall. This large air movement adequately captures and moves dust away from the blending operator but is of little benefit to the weighing operator. Beside the potential for excessive nuisance dust exposures, certain products require the use of a coloring compound (Molly Orange) that is 60% lead. While the quantity per batch is small (1-1/2 lbs.) and the production infrequent (10-20%), a potential for excessive lead exposure may exist.

   The major portion of the weighing operator's dust exposure occurs during the hand scooping of batch material from large drums to the plastic weighing containers, and the pouring of material from cut bags to the containers. Lesser exposures occur at the weighing scale where the

container contents are adjusted to the required weight. It is recommended that adequate local exhaust ventilation be provided for these operations. One possible exhaust system design for the scooping and bag dumping operations would be an enclosure in which all transferring would be done. The enclosure ventilation should be of such a design as to move the contaminant away from the operator's breathing zone. The enclosure would have the advantage of protecting the exhaust air flow from the strong air currents produced by the wall ventilators. The man's tasks should never require that he be between the dust source and the direction of movement of the exhaust air. An alternative system would be adjustable exhaust hoods that withdraw dust at each point of origin.

The weighing scale area should be provided with local exhaust ventilation. Here again, because of the strong air currents produced by the wall ventilators, a small exhausted enclosure for the scale would be most practical. This type of process exhaust ventilation may be in violation of city, county or state air pollution regulations and therefore require an appropriate dust collector. It is suggested that this aspect be thoroughly investigated prior to ventilation equipment installation. See Appendix A. (Conclusion-Recommendation 1)

2. Properly designed exhaust ventilation should reduce both nuisance dust and lead dust exposure to a minimum. It is recommended that the weighing operator be provided and required to wear a Bureau of Mines Approved dust filter respirator for protection against nuisance dust and lead dust. The blending operator, although his potential for exposure appears to be much less than that of the weighing operator, should be furnished a similar filter respirator for use during particularly dusty operations. See Appendix B. (Conclusion-Recommendation 2)

3. It is recognized good occupational health practice* to periodically monitor potential exposures to lead by analyzing blood and urine samples for lead content. Normal values for blood lead and urine lead samples have been established by the American Industrial Hygiene Association in their Hygienic Guide Series. It is suggested that a blood and urine sample from each of the operators in the Batch Blending Department be obtained by your clinic for delivery to our Environmental Hygiene Laboratory in New Haven for lead analysis. We should also have another set of such samples 2 to 4 days after a production run of PVC 1317-orange pipe has been run. Periodic urine-lead monitoring thereafter is recommended. Our laboratory can furnish your clinic the necessary information and supplies for the collection of these samples. (Conclusion-Recommendation 3)

4. During the course of this survey it was learned that two eye splash accidents had occurred in the handling of THERMOLITE(R). It is therefore recommended that safety glasses be worn and an eyewash fountain be installed in this department. (Conclusion-Recommendations 4 and 5)

*The new Federal Occupational Safety and Health Act to become effective April 28, 1971 will make mandatory standards of many of the "recommended practices" for industries engaged in interstate commerce.

5. Certain design modifications on the Welex Blender and Cooler and the dump hopper off the cooler will greatly reduce potential dust exposures to the blend operator and the general room dust. The following modifications should be considered:

   a. Because neither the blender nor the cooler tanks are equipped with downdraft exhaust ventilation, dust escapes at the open dump ports during loading and mixing of the dry batch material. The major escape of dust occurs during the vigorous mixing action of the blender. Before ventilation systems are considered for these units it is suggested that the loading ports be equipped with hatch devices that remain open only during the loading operation. Such devices may be sliding covers or spring-loaded swinging panels on the top of each port that close after each ingredient is dumped. While it is expected that there will be some release of dust when the ports are opened for loading, the wall ventilators should adequately remove this from the work area and alleviate the necessity for equipment ventilation.

   b. The cooler deposits the batch formulation into an open bin. The falling material is often entrained by air currents moving through the department. Before a local exhaust ventilation hood is considered, it is suggested that a lid be designed for the bin to prevent dust escapage. A flexible sleeve should connect the bin cover to the cooler dump spout.

6. The transferring of the batch material containers from the ground level to the blending platform is performed by stacking the full containers on a wooden pallet and then using a small forklift to raise the pallet to the upper level. The pallet is not provided with sidewalls nor does the forklift have an overhead guard to protect the man below in the event the containers fall from the pallet. It is suggested that the pallet be enclosed. (Conclusion-Recommendation 3)

7. Noise levels were well within acceptable limits in this department. No action is necessary at this time. See Figure 6.

Molding and Extruding Departments

Noise

Noise levels measured in the above departments are within acceptable limits for eight-hour exposures. See Figures 1, 2 and 4.

While noise levels in the injection molding operator's area is approximately 96 dB-A during grinding operations, the total exposure time for an 8-hour day is less than two hours. See Figure 3. The balance of the operator's time is spent in less noisy areas.

It should be noted that relatively straightforward methods exist for the effective control of grinder noise. Enclosed is information that may assist you in this regard. See Appendix C.

Primary Grinding Operation

Noise

Noise levels measured in this area with the grinder operating were approximately 97 dB-A. The two grinders are located in a relatively isolated area of the plant and are attended by one operator for 5 hours on the day shift only. The operator is supplied with and wears ear muffs.

An acoustical enclosure for these units is presently under consideration. The enclosed information may be of assistance in the design of such an enclosure. See Appendix C.

It should be noted that in addition to providing personal hearing protection to workers exposed to excessive noise levels, Safety and Health Standards for Federal Supply Contracts under the Walsh-Healey Public Contracts Act requires that an effective hearing conservation program be administered. We expect these requirements to be applied to the Occupational Safety and Health Act of 1970. Such a program includes:

1. Engineering to minimize noise exposure.

2. Measurement of the extent of hazard (noise survey).

3. Periodic audiometric testing of the exposed individual. This is required regardless of the fact the man is provided ear muffs.

It is therefore recommended that arrangements be made with your clinic to periodically have audiometric tests conducted on your grinder operators. Such tests will be required until the satisfactory completion of an acoustical enclosure reduces the level of exposure to noise.

If we can be of any further assistance to you, please do not hesitate to call.

Henry J. Muranko

Enclosure

Henry J. Muranko

Supplemental Information

Industrial Ventilation, A Manual of Recommended Practice. American Conference of Governmental Industrial Hygienists Committee on Industrial Ventilation, P.O. Box 453, Lansing, Michigan 48902.

Handbook of Process Ventilation, J. C. L. Dawson. The Industrial Press, 93 Worth Street, New York, N.Y. 1963.

OLI 4640

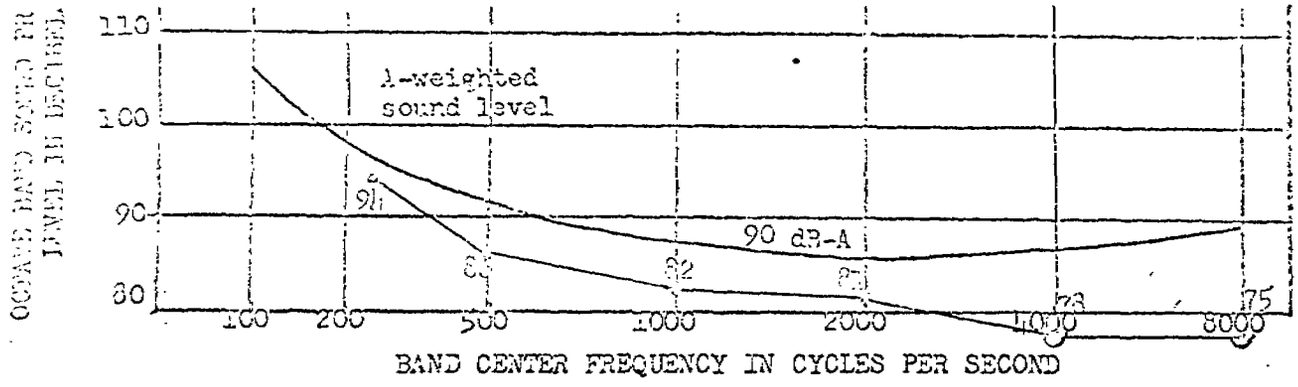

Figure 1

Area Injection Molding

Machine
No. 1

Remarks
Operator's position

Exposed
1

Exposure
Time
6 hr.

OLI 4641

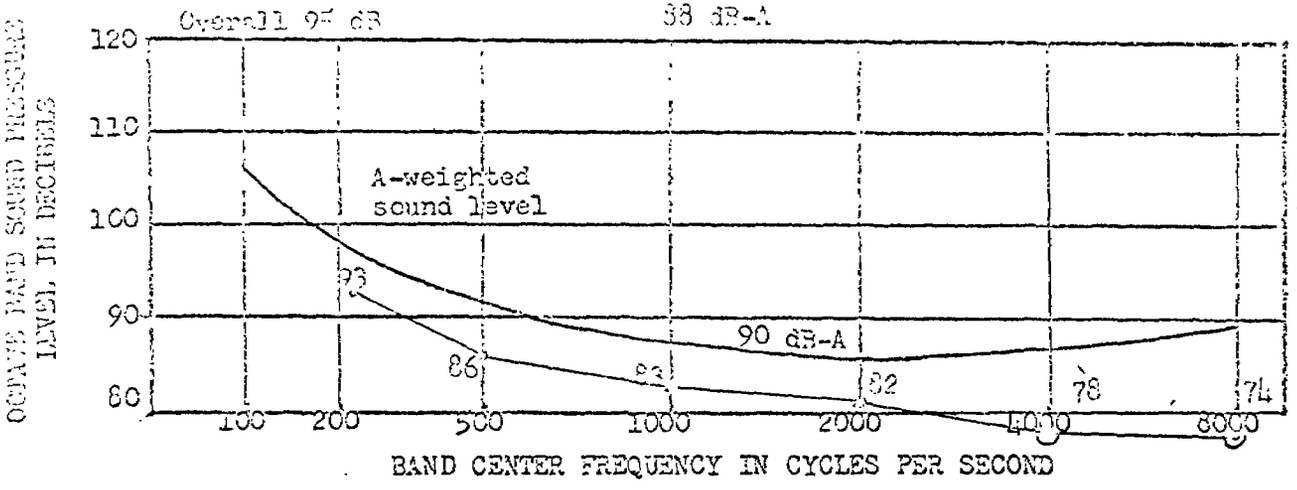

Figure 2

Date 3/22/71

Area Injection Molding

Machine
Between No. 2 and 3.

Remarks
Operator's position.

Personnel
Exposed
2

Exposure
Time
6 hr.

/ Values less than 80 db.

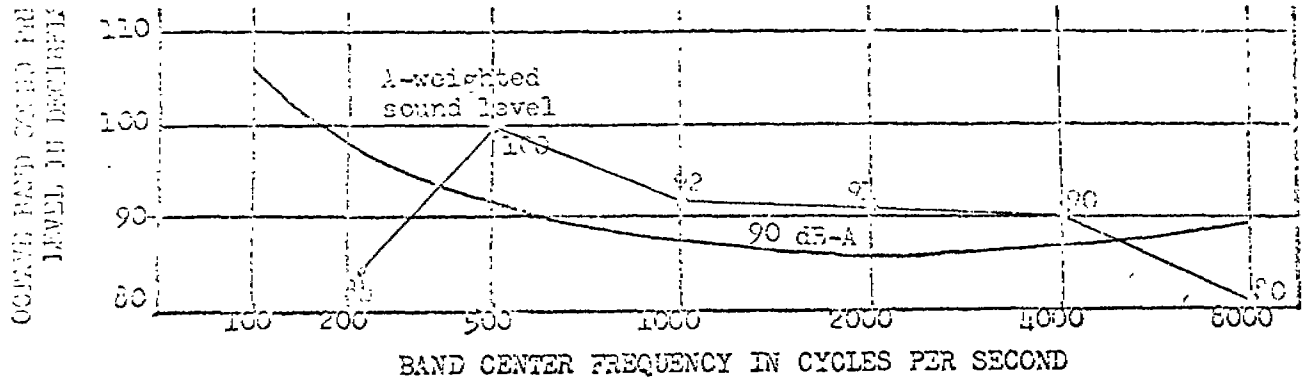

Figure 3

Area Injection molding

Machine No. 4

Remarks
Operator's position.
Grinder on.
Typical of all operators' exposures.

Personnel Exposed
All operators

Exposure Time
90 minutes per shift.

OLI 4642

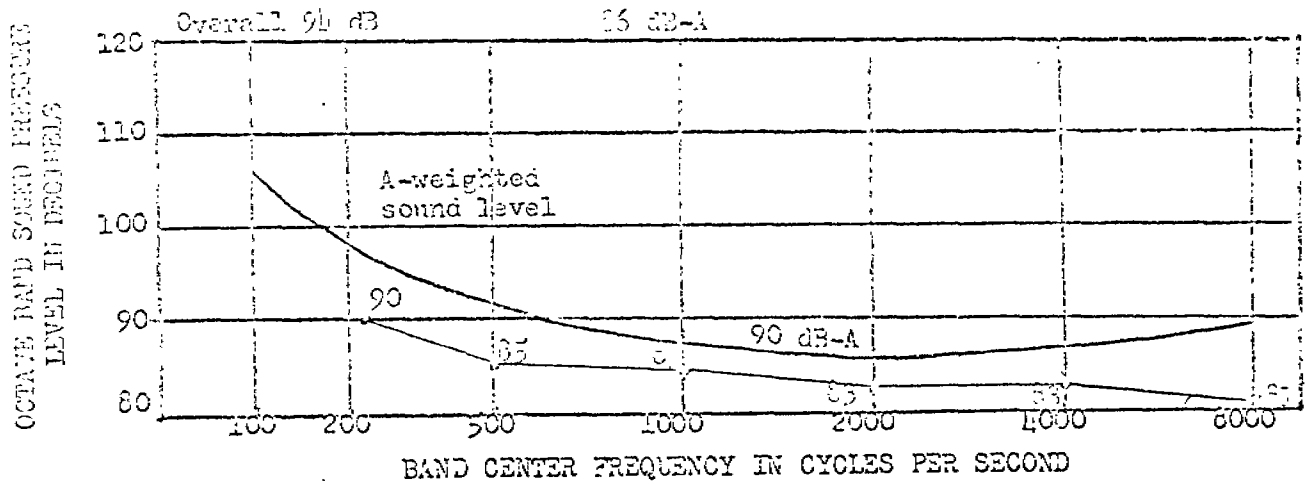

Figure 4

Date 3/22/71

Area Extruding

Machine Between No. 1 and 2

Remarks
Operator's position

Personnel Exposed
2

Exposure Time
8 hr.

( ) Values less than 80 dB

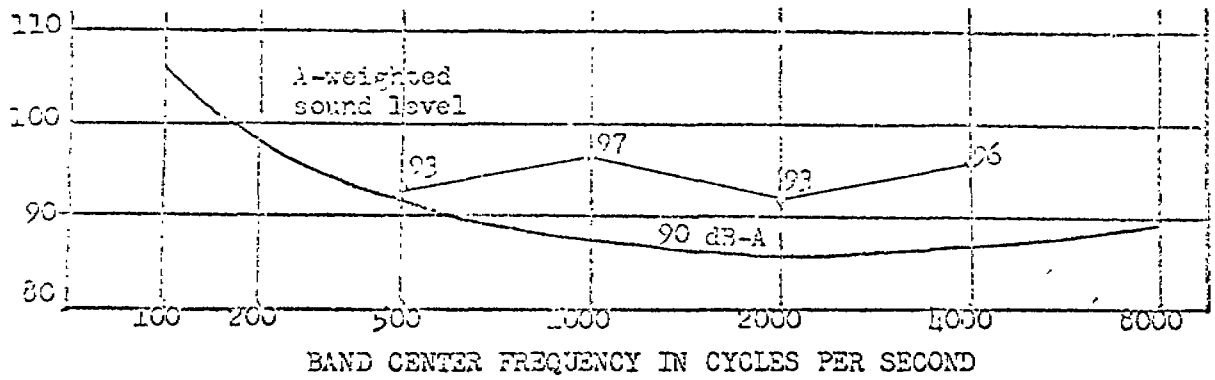

Figure 5

Area Shipping

Machine
Primary grinder

Remarks
Ear muffs worn by operator

Personnel Exposed
1

Exposure Time
8 hr.

OLI 4643

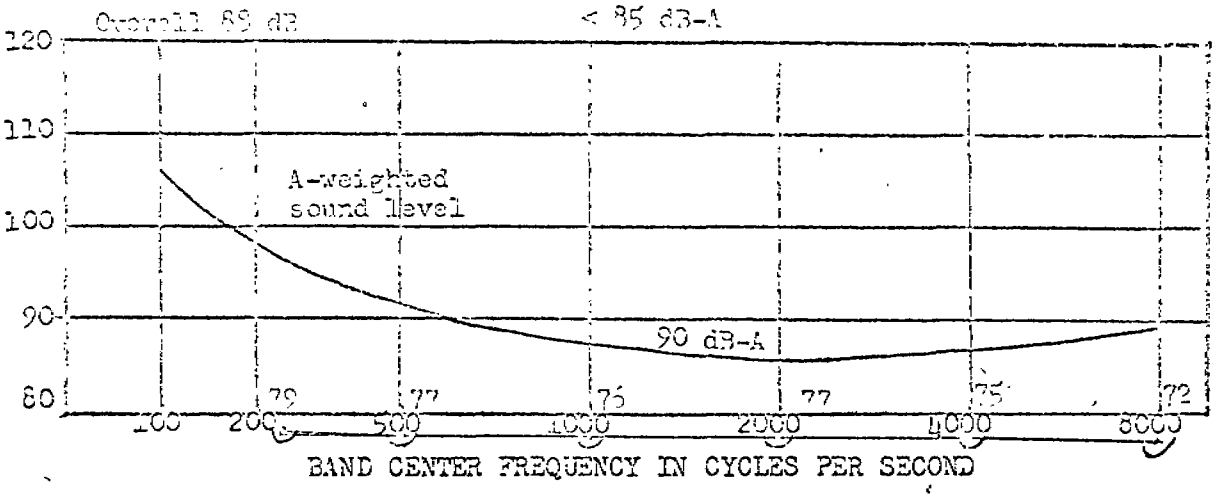

Figure 6

Date 3/22/71

Area Batch Blending Dept.

Machine
Scale

Remarks
Normal operations

Personnel Exposed
2

Exposure Time
8 hr.