

Source: Magnus Metal Division of National Lead Company, 1029 West Seventh Street, Cincinnati, Ohio

Material: Fumes and dust collected from the atmosphere of the plant

Date collected: 1-16-59

Inspection made by: Mr. L. J. Schafer and Mr. D. W. Yeager, The Kettering Laboratory for Dr. M. Zavon, Bureau of Industrial Health, Cincinnati Health Department

Method of collection: Electrostatic precipitator

Required: Determination of the concentration of lead in the air

The Plant

During the past year, mechanized equipment for production pouring has been installed in this plant. A roller conveyor transports the molds to a central ventilated pouring station and then to a ventilated shake-out station where castings are removed from the molds. The recovered molding sand is then conveyed to an exhausted mixer, and the reconditioned sand is returned to the molding machines. Most of the production is carried out on the mechanized equipment, but molds prepared by one machine, which has not yet been adapted to the mechanized production line, were being poured in the open. Except for the use of the mechanized production line, the plant was being operated in the same manner as it was at the time of our last visit.

Results

Table #1 records the concentrations of lead found at a number of locations within the plant.

Discussion

The day of this visit was unusually cold, and consequently all windows and doors were kept closed. Since there was no ventilation in the roof or ceiling, the density of the fume appeared to increase as the work progressed during the day.

The results of our tests show that the levels of concentration of lead in the atmosphere exceeded those considered satisfactory for this type of operation. While the ventilation of the mechanized production line collects a considerable portion of the lead fume produced in the pouring activities, the fumes and dust produced by other uncontrolled activities accumulate and build up the concentration to levels which are hazardous.

Recommendations

1. Steel covers should be provided for the ladles to prevent escape of fume. If practical, covered ladles of the commercial type should be employed. A more positive control of fume from this source is provided by an exhaust hood which can be fastened to the bars of the electrified monorail crane used to transport the ladles to the pouring stations. A flexible tube, connected to a fan mounted on the trolley, can then be used to discharge the fume toward the ceiling.

2. Flanges or short curtain walls should be installed about the suction opening of the pouring station on the mechanized production line. The flanges or walls will restrict the suction and force the air to pass over the flask into the opening.

3. The housekeeping within the plant should be improved.

The dust which accumulates on floors and equipment should be removed periodically so that traffic and vibrations do not redisperse dusts into the atmosphere.

4. The general ventilation of the plant should be improved by the strategic location of a number of roof or ceiling fans.

5. The areas in which scrap is being handled should be ventilated. Dust produced in these areas contaminate other areas and should be controlled by providing proper local exhaust at locations where dust is most likely to be produced.

From The Kettering Laboratory in the Department of
Preventive Medicine and Industrial Health, College of
Medicine, University of Cincinnati, Cincinnati, Ohio

March 5, 1959

KE 0005333

Concentrations of Lead in the Air at a Number of
Locations in the Plant of the Magnus Metal Division of the National Lead

Analysis Number	Description	Date	Start of Sampling
59A-601	Breathing zone - while #4 Schwartz furnace was being charged with scrap.	1-16-59	10:00 a.m.
59A-602	Breathing zone - while molds were being poured at pouring station	1-16-59	10:12 a.m.
59A-603	Breathing zone - at the Schwartz furnace, while two ladles were being filled with molten metal.	1-16-59	10:30 a.m.
59A-604	General air - in the aisle 10 feet behind the ventilated pouring station.	1-16-59	10:50 a.m.
59A-605	Breathing zone - at the scales while scrap was being weighed for remelt.	1-16-59	11:10 a.m.
59A-606	Breathing zone - while a reclaiming kettle was being filled with babbit metal.	1-16-59	11:10 a.m.
59A-607	Breathing zone - while metal was being poured in the unvented pouring area.	1-16-59	11:28 a.m.
59A-608	Breathing zone - while metal was being poured in the unvented pouring area.	1-16-59	11:40 a.m.
59A-609	General atmosphere - in center of foundry approximately 100 feet from the furnace area.	1-16-59	12:00 N
59A-610	Breathing zone - while metal was being poured in the finishing room.	1-16-59	1:40 p.m.
59A-611	Breathing zone - at the broaching machine in the finishing room.	1-16-59	1:55 p.m.

Maximum allowable concentration for lead is 0.200 mg./M³

Note: Respirators were worn by all men at the above operations except in the fin

Handwritten:
To
Magnus
Metal Div. of
Nat'l Health Program

4-13-1956

Cincinnati Health Department - Industrial Health

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Room 238 City Hall

Kettering Laboratory

Eden and Bethesda Avenues - Cinti. 19, Ohio

For: Analysis of Fumes and Dust Samples Collected from Atmosphere
of Metal Foundry of Magnus Metal Division of National Lead
Company for the Determination of the Concentration of Lead
in the Air

. \$133.00

Kettering Laboratory
Robert A. Kehoe, M.D.

Director

KE 0005335

N 5211 02

<u>Analysis Number</u>	<u>Description</u>	<u>Date</u>
56A-2175	Between #1 and #2 Pouring Bays on casting floor while follow- ing metal pourer during cast- ing operation.	4-9-56
56A-2176	In main aisle near "sand filler."	4-9-56
56A-2177	General area of finishing room; molten babbit metal being handled.	4-9-56

*Millions of Particles per Cubic Foot of Air

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<u>Start of Sampling</u>	<u>Duration of Sampling in Minutes</u>	<u>Pb Mg./M³</u>	<u>MPPCF*</u>
9:46 A.M.	4.5	1.98	
10:00 A.M.	5.5	0.04	2.0
10:05 A.M.	5.75	0.07	

Source:

Magnus Metal Divison of National Lead Company,
1029 West Seventh Street, Cincinnati, Ohio

Material:

Fumes and dust collected from atmosphere of metal foun

Dates Collected:

4-4,9-56

Inspection made by:

Dr. M. Zavon, Bureau of Industrial Health, Cincinnati
Department, Mr. J. Cholak and Mr. L. J. Schafer, Kett

Method of Collection:

Electrostatic Precipitator (2.5 cfm.)

Required:

Determination of the concentration of lead in the air

Results

<u>Analysis Number</u>	<u>Description</u>	<u>Date</u>	<u>Start of Sampling</u>	<u>Duration of Sampling in Minutes</u>
56A-2029	At #4 melt out furnace, while pouring babbit (88% lead) into molds and while dipping out furnaces.	4-4-56	2:12 P.M.	4.75
56A-2093	At Magnus station #3. In charging aisle of the Schwartz furnace area (brass).	4-4-56	2:20 P.M.	3.0
56A-2094	At Magnus station #3 on pouring side of Schwartz furnace while filling one pot (brass).	4-4-56	2:27 P.M.	2.5
56A-2095	At scales while loading and weighing scrap journals for remelting.	4-4-56	2:40 P.M.	5.0
56A-2096	At shake out in journal area. No metal pouring, sand being handled.	4-4-56	2:45 P.M.	4.5
56A-2174	Between #1 and #2 Pouring Bays on casting floor. Before pouring.	4-9-56	9:40 A.M.	4.5