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DIVISION OF SAFETY AND HYGIENE
COLUMBUS, OHIO

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Columbus, Ohio

In re: The Goodyear Tire & Rubber Company
Akron, Ohio

On May 1 and 2, 1950, a visit was made to the above named company to take lead tests. Request for these tests was made by Jack Kidney, Safety Director and contact was made with Mr. Kidney; Mr. Nelson, Industrial Hygienist; L. E. Smith, Divisional Foreman, R. E. Hoon, Department Foreman and I Cottington, Safety and Labor Representative.

The Department wherein the lead tests were taken is located in Plant #2 and is Department 275C, Lead Insulate Section of the Mechanical Goods Division.

For many years The Goodyear Company has furnished clothing and a 23 minute bath period, 15 minutes of which is paid by the company, to men who work in the Lead Insulate Section.

In this Section both rubber and plastic hose are first covered by an extrusion method with a layer of 99% (plus) lead. This layer or sheath makes a design on the outside of the hose. After the hose is cured, this sheath is removed by a so-called "stripping" operation.

To perform this lead insulating (or sheathing) operation, thousands of pounds of lead are melted and poured per shift.

The melting operations are performed at a circular type station where the lead is first melted in a large enclosed gas fired pot and, while in a molten state, pumped through tubes into a pouring unit. This pouring unit allows the molten metal to flow into molds, thus producing billets.

On the date of visit, two men were engaged in the pouring operations. On one side of the unit the employee caps the lead billets by automatic pouring; the other employee working on the side that only contains a small number of billet molds, caps by using a hand ladle, dipping from a small lead pot. This pot is exhausted but does not contain a thermostat. The temperature reading on the large pot showed 800° F. as temperature of the melt.

After the molds are poured and capped, and a sufficient time allowed for cooling, they are removed by the use of a hoist and placed on skids. The fill-up time was stated to be 40/100ths of a minute and an employee may pour as many as 140 billets in six hours. He therefore spends about one hour and ten minutes actually pouring in a six hour shift.

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The dross is removed in the large melt pot approximately once per day. This dross is placed in buckets located under a hood which is connected to an exhaust system.

An electrostatic precipitator was used to take the samples. There were three samples taken.

It was estimated that the highest concentration would be in the breathing zone of the employee who caps the billets by hand, using the ladle. The precipitator was started and allowed to run for six minutes and then shut off due to the fact that it was then the lunch period and all operations ceased. After the employees returned from lunch the precipitator was again started and was allowed to run until it had collected one cubic meter of air. This sample contained 0.055 milligrams of lead per cubic meter of air. During the time of sampling there was a spillage of overflow over the top of the billet molds. The writer asked whether this was an unusual occurrence and was informed by Mr. Noon that it invariably happens several times per shift.

In looking over the men's clothing, it was noted that they contained some lead dust. It was thought that this lead dust was coming from the handling of the billets when they are pulled out of the molds and pushed over a monorail to the skids. There was a considerable amount of lead scrap on the floor around this unit and an employee known as a "lead burner" uses a torch to remove this scrap lead periodically. This lead burner is a Maintenance Department employee.

The next sample was taken in the breathing zone of an employee working on a Robertson stripper, #61-37. This stripper removes the lead sheath by slitting it on each side as it passes through corrugated rollers. The ends of these slit sections are then picked up by an upper and lower roller, reversed and rolled back (much in the manner in which one peels a banana) and carried down into a conveyor which carries them to the lead melting pot. This conveyor is under the floor.

There is mica dust on the outside of the hose and there is an exhaust system on the stripper just above the knives. The lead sheath breaks frequently which necessitates stopping the machine and re-threading the lead sheath back into the rollers. The hose

is on a large reel at the rear of the machine and, in several cases, the writer noted that the end of the loaded hose on the reel continually struck the floor. This produced a hazard. There was a sign warning of the danger from the hose striking on the floor but it was practically illegible.

The lead sample obtained at the above operation contained 0.016 milligrams of lead per cubic meter of air.

Another sample was taken in Building 63, at an extrusion press, #6. This sample was taken on the east side of the die block at the die holder outlet. This is a large press wherein a billet is placed in the top end, by pressure exerted by a ram, the lead passes through a die containing the hose. The temperature of the die block on the date of visit was 325° F. The loaded hose passes out of the die block for a distance of about 6 to 8 inches and then passes into a water-spray. This sample only contained 0.009 milligrams of lead per cubic meter of air.

It was stated that the sheath of lead cannot be applied to the hose at this die block if the die block reaches a temperature greater than 325° F.

Years ago Goodyear experienced some lead poisoning cases in this Lead Insulate Section. The writer was told that at one time there were numerous lead melting operations being performed over a given area but, of course, this has all been changed to a centralized lead pouring unit.

When the original cases of lead poisoning developed, Goodyear thought it advisable to furnish clothing to all the men in this Section and also to allow each employee a specified period for showering. This practice has been carried on for years but now, due to economic reasons, Goodyear feels that the issuance of clothing and time allowance for showering is no longer necessary. It was also brought to the writer's attention that a competitive company does not furnish clothing or shower baths to their employees.

It has been our finding that lead presents many serious problems. Under the present arrangements, lead is under control. However, if it once gets out of control, it will be very difficult to check and find the exact source of the hazard.

When a company has succeeded (as Goodyear has) in practically solving these lead problems, it seems to the writer unwise to eliminate any of the precautions which have protected both

the company and their employees for so many years simply on an economic basis.

The maximum allowable concentration (MAC) for lead is 0.15 milligrams of lead per cubic meter of air. The samples taken are, of course, well below the MAC. However, one must take into consideration that these samples (or at least the first two) show the lead concentration in the breathing zones of the operators. They do not take in the lead dust which might cling to, or impregnate the employees' clothing, if change of clothing is not provided.

Experience shows that the average employee in a plant usually wears his work clothes for an indefinite period of time before they are laundered. The accumulation of lead on an employee's clothing would be greatest at the lead pouring station due to the handling of the billets and where the employee is required to handle the loaded hose before the sheath is removed.

The writer was informed that approximately 50% of the men who work in this Section do not handle lead in any form, nor do they handle the leaded hose.

In the opinion of the writer, since lead is a cumulative poison and since there could be a possibility of a man inhaling lead dust from his clothes, it would be reasonable and proper that the men who handle and have contact with lead be required to change their clothing and take showers, as they are doing now; and that the men who have absolutely no contact with lead, be released from these precautions.

Only a job break-down analysis can determine which employees do not handle lead in any form and what the percentage of these employees, in relation to the number of employees in this Section, is. If, after a complete analysis, it is found that the percentage of those handling the lead is far greater than the estimated fifty percent (50%), i. e., in the range of from 85 to 95 percent, then it would be sensible to allow the remaining few employees to have the same privileges of clothing and bathing as the majority even though they seemingly have no personal contact with the lead.

Regarding the maintenance man who must burn the lead scrap from around the molds, the writer feels that this lead can be scraped off the molds and floor, thus eliminating the lead fumes from being generated by means of a torch.

There are two possible lead hazards at the melting unit and it is therefore recommended that:

1. The small gas fired melt pot be thermostatically controlled;

2. The exhaust system over the dross buckets be re-designed so as to prevent dross dust from escaping into the atmosphere.

In all probability the latter recommendation can be complied with by making this into a closed type unit, the bucket to be filled within the enclosure.

The writer feels that Goodyear should be congratulated for its endeavor to eliminate lead poisoning but does not feel that a relaxing of the rigid precautions now being enforced is advisable.

Respectfully submitted,

DON MANN

DM:fml

SAFETY ADVISOR.