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DIVISION OF SAFETY AND HYGIENE
May 4, 1943

James H. Flicker, Superintendent
Division of Safety and Hygiene
Columbus, Ohio

In re: The Goodyear Tire & Rubber Co.,
Akron 16, Ohio

On April 27, 1943, a visit was made to the above named company for an industrial hygiene survey requested by J. T. Kidney, Safety Director, in a letter dated April 20, 1943.

Contact was made with J. T. Kidney; Dr. Hatch, Medical Director; R. W. Fickes, Safety Supervisor; W. T. Van Orman, Research Engineer; Henry W. Ernst, in charge of Pliofilm Research; W. H. Michel, in charge of Plastic Research; D. C. Butts, Superintendent of Research; H. J. Osterhof, Director of Research; A. M. Clifford, Assistant Director of Research; T. W. Fisher, Foreman of Air Foam; D. M. Cornell, in charge of Safety of Plant C; Jack Creager, Superintendent of Chemical Storage; Walter Schroeder, Assistant Superintendent of Chemical Storage; T. A. Pringle, Supervisor in charge of Asbestos Operations; Hoot W. Mellan, Division Foreman of Paint Department in Plant A; and Edward Myers, Assistant Foreman of Paint Department in Plant A.

This company manufactures tires, deep freeze units, metal caskets, life rafts, balloons, pliofilm, air foam mattresses and cushions and numerous other types of rubber goods.

The first building to be surveyed was that of the Research Department wherein all research problems are analyzed. At the time of visit, the chief hazard was that of exposure to benzol fumes. A pilot plant is constructed in one area of this research building and on the date of visit it was not in operation due to a mechanical breakdown. This research building is extremely modern and those in charge of all operations are highly trained in research activities. They are well aware of the toxicity of benzol. It was deemed advisable to plan a return to this plant when benzol was being used and take spot check tests to determine the concentrations in various areas. Only one man has complained of benzol poisoning and he is not engaged in research operations at the present time.

In a meeting with various heads of the departments it was suggested that they obtain instruments which would give them checks on their operations at various intervals so that they would have constant information of top concentration of any type of toxic material that they might be handling. One must realize that in a research department, conditions change daily and the amount of material handled is in a lesser quantity than would be used under production schedules. The writer was informed that benzol was carried to various operations in open containers. He believes that the movement of benzol should either be through enclosed systems, or transported in containers having a tight lid. We have always been under the impression that a concentration of 50 parts per million of benzol was considered safe. However, various authorities seem to agree that 35 parts per million should now be classified as a safe concentration. As soon as conditions are corrected so that a benzol run may be started, the writer will make a return visit to this research department.

In Department 146-A, on the third floor, pliofilm is manufactured. Large amounts of benzol are used in this department. Various type machines such as dryers, spreaders, mixers, etc., are all exhausted. There are, however, a few areas of the plant and a few conditions wherein an employee might be subjected to an extremely high concentration of benzol. The benzol test taken at the front end of the dryer showed 120 parts per million. The employees working on this dryer are well aware of the toxicity of benzol and have been instructed to, and do, wear respirators when they are required to enter the front end of this dryer. The door which leads into the dryer is marked, indicating that respirators must be donned before entrance. This dryer is #C.

A spreader, also #C, contains an effective exhaust system but a test showed 120 parts per million under the dome. Again, employees use respirators whenever they enter this spreader. On one of these spreaders, at the back end, there was a door which shows no warning as to the necessity of wearing a respirator. The writer obtained a concentration of over 1,000 parts per million just inside this door. The head of the Department stated that no one worked inside the back of this spreader. But, nevertheless, there was a door there leading into the mechanical workings. It is quite possible that a maintenance man, or some other employee, might enter this room. In so doing, he would subject himself to an extremely dangerous concentration of benzol fumes which might even prove fatal. I am therefore recommending that warning signs be posted on this door and that entrance be obtained only with a written order from the superintendent.

In Building #32, on the fourth floor, in Department 1h6-A, there was located storage cases. These storage cases contain benzol. In a test taken at the top of a tank, the test showed 500 parts per million of benzol. The information obtainable seemed to indicate that one or more employees would spend approximately one hour per day at these tanks. If this be the case, the men are exposed to a definite benzol hazard. There are no exhaust systems outside of this tank at the openings. I believe that this is a solvent recovery system. I recommend that a special exhaust system be built around the tops of these openings so that no employee would be exposed to high benzol fumes.

In Department 273-A, employees are engaged in pouring lead into molds. The temperature of the lead is approximately 725°F. The company has experienced no lead poisoning cases at this lead pouring operation and due to the fact that the temperature is extremely low, or at a point wherein high concentrations of lead fumes do not develop, I do not believe that a lead hazard exists. On my second visit to the plant I plan to obtain a lead sample which will show the exact concentration of lead fumes. I am not greatly concerned about this pouring operation but there seems to be the possibility, in case a thermostat operating the temperature of the melt should fail to function, of a dangerous situation developing.

In Department 1h8, in the fuel tank area, numerous bullet proof tanks are being constructed. This is an extremely well lighted and well ventilated area. The foreman stated that they have not experienced any difficulty from dermatitis or headaches even though various types of cements are being used. The foreman stated that there is no benzol in any of these cements. He stated that they had had one case of dermatitis but the employee involved was not engaged in any pasting operation but worked in another department adjacent to the fuel tank area. The writer could find no definite occupational disease hazard in this department.

In Plant #3, Department 364, Air Foam Division, approximately three hundred and twenty employees are engaged in making air foam mattresses and automobile cushions. Up to this time the writer was greatly impressed with the conditions in the departments that had been visited. I am sorry that I cannot say the same for this Air Foam Department. In checking the first aid record, I found that from twenty to thirty cases of dermatitis had developed in this department over a period of months. At the present time they are operating four shifts of six hours each. It was stated that it is very difficult to keep the department in a clean condition due to the high production necessary. Only in case of a breakdown was it possible for the men to steam the machines or floors. The airfoam operation is performed in an area which has a very low ceiling and probably an excessive amount of ventilation would interfere with the processes of production. One can hardly expect employees to keep and maintain cleanliness in a department where the machines are not only in continuous operation but where they also throw off material into the working area. I believe that conditions in this room could be greatly improved and dermatitis practically eliminated if the filling operation is re-designed. An employee must gauge the amount of material entering the mold at the present time. If an excess is poured, another employee, using a level, must remove this excess, and toss it into the next mold on the conveyor. The over-run is quite high. As a matter of fact, it looked to me like a terrific waste of material. After this mold is closed by mechanical action, again a considerable amount of material is forced out at the edges. This material, being rubber, adheres to the various parts of the conveyor and also falls to the floor. It cannot be removed except by the use of steam. In order to do this, the operations would have to be shut down.

I suggest that the technical and engineering departments have a conference to devise ways and means by which a specific amount of material, sufficient for the proper molding of the article, can be automatically gauged. This would prevent the latex rubber from covering the employees from head to foot as it now does. I was informed that the stirring or whipping machine was to be moved to the second floor within a few weeks. The composition of the material seems to be constant and I am wondering why so many agitators or whipping machines are used. Would it be possible to whip this material in one or two units, thus eliminating the many whipping operations on the so-called "merry-go-round"? This merry-go-round also throws the rubber in many directions and on the date of visit from one to three inches of rubber was deposited on this unit. Men are required to take the cans from the merry-go-round and wash them. In so doing, they are exposed to the chemicals in the rubber plus water. I believe it would be possible to design a unit wherein these cans could be placed in hot water jets - or steam jets - to automatically wash them. The containers could revolve in this enclosed unit. I suggest that this problem be presented to the engineering department.

On one end of the conveyor line, an employee must remove the mattresses or cushions

from a rinsing unit and place them in a centrifuge. This is an extremely wet operation and the employee should be furnished proper clothing so that his regular clothes will not be in a wet condition at all times. In the rear of this air foam unit, employees are spraying a cartomax on molds. There is a constant fog around this operation and it could be eliminated by dipping the molds into a vat of wax.

The men's washrooms in this Division are not as clean as they should be. New and modern washrooms should be provided for the men but I firmly believe that the filling operation is the chief source of trouble in this Department. Of course, the other operations should be re-designed if dermatitis is to be eliminated in this Department. On the date of visit, evidently rubber had entered the drains near the centrifuge and the water could not be removed from the floor. I sincerely hope that Management will see fit to take action and improve the working conditions here.

In Plant C, which is the new air foam unit, the conditions are very good. They have new mixing rooms and the machinery is all enclosed. The air foam material is rinsed in an enclosed system and the writer was greatly pleased with this new unit. There is, however, the same problem of filling the molds and it is quite possible that conditions in the filling room here might become comparable to those in the old plant, that is, the rubber may adhere to the conveyor line.

The company is installing a new pliofilm unit in this plant and while it is far from complete, one can see that adequate exhaust systems will be used to eliminate high concentrations. I believe that before this pliofilm unit is placed in operation adequate checks should be made to determine the concentrations of the benzol fumes.

In the chemical storage, Department 245A, numerous chemicals are stored such as benzol, carbondisulphide, etc. The chemical storage is equipped with explosion proof lights. The tanks are all grounded and there is a sprinkler system throughout. I recommend that the motor which is a spark producer be removed from this storage unit and a non-explosive motor substituted. I am wondering why Goodyear does not see fit to use color marking for the various pipes. One may think that this is not necessary but we have found in many instances that men have disconnected the wrong pipe thereby causing injury, property damage and, in some instances, death. I do not believe that it is asking too much to paint these pipes containing toxic materials, with the proper designated color.

In Department 271A, asbestos is used in the coating of an insulating material. The asbestos is obtained from two different concerns and the two types are blended together. In the blending operations various exhaust systems are used to remove the short fibres, the copper fuse wire and a sandlike material. The writer was surprised to find from ten to fifteen pounds of sandlike material per thousand pounds of asbestos. On my second visit, I hope to obtain a sample of this material which in all respects simulates sand and will, if approved by the Commission, have an x-ray diffraction run on this material which will definitely give us the percentage of free silica in this so-called sand. There is no silica hazard connected with the removal of this sand because the particles are extremely large and drop to the floor. If it is sand, the siliconic particles of course would still be present in the asbestos and would be carried over to a dust collector. Men are required to go into this dust collector after it is shut down and shovel the fine asbestos dust from the floor inside the collector into trucks. They do not wear respirators. This is a definite asbestos hazard and should be eliminated. No man should be allowed to go into any type dust collector when cleaning if they are not supplied with approved Bureau of Mines dust respirators. Men are required to shovel asbestos from trucks into the mixers and again inhale some of the dust. The writer was informed that within a few months this operation may be changed to automatic filling. There are exhaust systems on the mixers but the shoveling operation causes the exposure.

In Plant A-Dock, they are manufacturing deep freeze units and these units are painted in Department 246, called York Paint Line. This paint line has, on one side, a water-fall system and the exhaust system is removing air at the rate of 200 cubic feet per minute. Waterfall systems are well designed but the painting of the various parts of the refrigerators presents a complicated problem. There are five painters spraying cabinets and doors in this line. They are literally covered with paint due to the space in which they must work in order to spray the materials. For example, they must stand between the exhaust system and the painting operations to paint one side of the door. When they spray the large cabinets, the cabinet itself prevents the movement of air into the exhaust system. I believe that this paint line is only 8'

wide and is too narrow for the large units. If the doors were hung in a vertical position instead of a horizontal one, the men could spray these doors and not have to stand between the exhaust system. But this would not prevent them being exposed to high concentrations of paint and paint fumes while spraying the large cabinets. I do not believe it is possible to spray these units in this restricted space without the men being exposed to these fumes. I am not making recommendations on this paint set-up, I am merely making some suggestions. Again, this is an engineering problem that demands technical skill. In visiting other plants doing this type of work, I find that they not only use sidewall waterfall systems but also downdraft floor water units. If this paint line could be enlarged so that a downdraft system could be installed, I believe that it would greatly reduce the exposure. If several of the men from top management would stand inside this paint booth while spraying operations were in progress, I firmly believe they would be convinced that re-designing is necessary.

In the large cement mixing department, numerous cements are compounded. All the mixers are adequately exhausted and the cleanliness of the mixing room was praiseworthy. It was extremely confusing to the writer as to just what type of solvents were used in the cements. I fully realize that this is a trade secret but, nevertheless, it presents a complicated picture in making the proper determinations upon an unknown solvent listed by a code name. I was informed that carbon tetrachloride was used in large amounts in some processes. Carbon tetrachloride is, of course, very toxic and should be used only under proper supervision as to quantities used and the locations where used should be carefully checked for vapor. The company is endeavoring to correlate this information and within a short period of time I am quite sure that any department handling carbon tetrachloride will be so checked. In all probability, there are many other toxic compounds used in the cements and I would suggest that where toxic materials are used, close check be given as to quantity and concentration.

A few weeks ago we investigated an explosion in an ammonia compressor room. The writer visited a compressor room at the Goodyear Company. The engineer in charge of this room is to be congratulated for the arrangements and safeguards. He is charging the ammonia line outside of the building and thus eliminating the possibility of high concentrations of ammonia entering the compressor room. The emitter for this synchronous motor is located in another room and this eliminates the possibility of sparks. There is, however, a sparking motor located in one corner of this compressor room which is used to pump ice water for various units. I recommend that this sparking motor be removed from the compressor room. There were three barrels of oil which had been temporarily placed in this room and I again strongly recommend that this be discontinued. A compressor room should never be used to store barrels of oil. I also recommend that all charge and discharge valves be marked in accordance with their designated function.

It was indeed a pleasure to survey this mammoth plant and the courtesy and cooperation shown by management is deeply appreciated.

I sincerely hope that the statements contained herein will be accepted with the thought in mind that we of the Division of Safety and Hygiene are acting in an advisory capacity and striving for the elimination of industrial hazards.

Respectfully submitted,

DON EBERA, SAFETY ADVISOR.

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