THE INDUSTRIAL COMMISSION OF OHIO
DIVISION OF SAFETY AND HYGIENE
700 West Third Avenue
Columbus 12, Ohio

PLAINTIFF'S EXHIBIT BRK-126

February 8, 1963

Inland Division
General Motors Corporation
Vandalia, Ohio

1. On January 11, 1963, a visit was made to the above named company to check industrial hygiene conditions in department 176, where the company makes automobile safety pads (crash pads). This visit was made at the request of the Department of Industrial Relations.

2. Contact was made with John F. Stephens, Senior Industrial Hygienist, General Motors Corporation, Detroit; Stanley Wright, Safety Director of the Inland Division; H. J. Riley, Safety Engineer, Vandalia Plant; and Mark Smith, General Foreman of the Crash Pad Department.

3. The company manufactures safety pads for automobile dash boards, from polyurethane or toluene diisocyanate (TDI).

4. The automobile crash pads are made in building #31, which is approximately 750' x 750' x 20' to the roof. This building was originally an air conditioned building with few, if any, windows. The company has discontinued the use of the air conditioned unit. However, air is continuously circulated through the system.

Department #176 in which the crash pads are made is located in this building and occupies an area approximately 200' x 192'. Approximately 106,000 cubic feet of air per minute (cfm) is circulated through this area. Approximately 20% or 21,000 cfm is make-up air. Measurements with a velometer at the various local exhausts indicate that approximately 20,000 cfm is exhausted. A reading made at an open door indicated that the building is under a slight vacuum - there was an air velocity of 500 feet per minute (fpm) through the door.

5. Department #176 has eight foaming machines which are custom made, two ovens in which the foam is cured and seven lines for cleaning excess TDI and finger prints from the foam pads. The foaming machines are ventilated where the foam goes into the molds and also where the excess foam goes into boxes. The slots that provide the ventilation are approximately 2" x 10" and the air velocity is in excess of 1,000 fpm. This exhaust appears to be adequate. The forms or molds containing the foamed material go into ovens where it is heated to 200°F.

The following air measurements were taken with a velometer:

| | |
|---|---|
| West Oven Outlet | 250 - 300 fpm |
| West Oven Inlet | 250 - 300 fpm |
| East Oven Outlet | 100 - 300 fpm |
| East Oven Inlet | 50 - 100 fpm |

There is additional slot exhaust ventilation at the outlet to the East oven which interfered with air velocity measurements. The actual air velocity is probably greatly in excess of the figure given for this opening. These openings are approximately 5' x 4'. The air velocity is such that none of the vapors or fumes from the ovens come back into the area. The ventilation is considered adequate.

6. The employment in department 9176 for three shifts is as follows:

75 - working with TDI

70 - cleaning with alcohol and stoddard solvent

259 - doing various other jobs, including making vinyl skin

404 - TOTAL EMPLOYMENT

7. The following samples were taken for TDI:

| Sample | Location | PPM* |
|---|---|---|
| 1 | Breathing zone of No. 1 former operator on west machine. | less than .01 |
| 2 | Breathing zone of operator unloading foam pads from mold at conveyor after the foam had gone through the oven. | less than .01 |
| 3 | General sample, all foaming units. | less than .01 |
| 4 | Corvette foaming room, which room is approximately 20' x 30' x 20' and has local exhaust ventilation. | less than .01 |

* Parts per million of TDI (The method is sensitive to .01 ppm)

8. The threshold limit value for TDI, according to the American Conference of Governmental Industrial Hygienists, is .02 parts per million. Bulletin 203 of the Industrial Commission of Ohio has not set a limit for TDI. The threshold limit value is a value to which it is believed employees may be exposed, day after day, without adverse effect on their health.

9. The following tests were taken with a Davis Vapotester:

| Location | PPM* |
|---|---|
| Breathing zone of operator wiping crash pads with stoddard solvent. She was using a rag. | 0 to 40 |
| Breathing zone of operator removing excess foam and finger prints from crash pads using ethyl alcohol to which 5% methyl alcohol had been added. | 0 to 400 |

* Parts per million of stoddard solvent or alcohol.

Employees spent only approximately one-fifth of their time using stoddard solvent or alcohol.

10. The threshold limit value for petroleum naphtha, according to Bulletin 203 of the Industrial Commission of Ohio is 750 parts per million, and according to the American Conference of Governmental Industrial Hygienists, 500 parts per million. Petroleum naphtha and stoddard solvent may be considered as the same chemical. The threshold limit value for ethyl alcohol, according to the American Conference of Governmental Industrial Hygienists is 1,000 parts per million. Bulletin 203 sets no limit for ethyl alcohol. The threshold limit value for methyl alcohol which is used as a denaturant in the alcohol (5% in the alcohol mixture) is 200 parts per million. The percentage of methyl alcohol is too low to be considered in calculating the health hazard of the alcohol.

10. (cont'd.)

The flash point of the stoddard solvent used in this plant varies between 150°F - 180°F. The flash point for ethyl alcohol is 55°F, and for methyl alcohol, 52°F.

11. Since the company uses 27½ gallon of stoddard solvent and 17 gallons of alcohol per day in an open area without the benefit of local exhaust ventilation, it is believed that they should give consideration to the providing of local exhaust ventilation. It should be pointed out that general ventilation throughout the plant keeps the concentration of vapors from building up in this area.

12. The concentrations of TDI, stoddard solvent, and alcohol, found in this plant do not appear to exceed threshold limit values established by the American Conference of Governmental Industrial Hygienists, or Bulletin 203 of the Industrial Commission. There appears to be no violation of Bulletin 203. No recommendations are made at this time.

13. It was a pleasure to visit this plant and the cooperation extended is greatly appreciated.

DeWitt Huffman
Industrial Hygiene Engineer

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