

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
CENTER FOR DISEASE CONTROL  
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH  
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION  
REPORT HE 79-95-613

FEDERAL-MOGUL CORPORATION  
GALLIPOLIS, OHIO

September 1979

I. TOXICITY DETERMINATION

Based on the results of the environmental evaluation and confidential employee interview conducted by the National Institute for Occupational Safety and Health (NIOSH) on July 11-12, 1979, it has been determined that a health hazard did not exist in fabrication operations using asbestos board at the time of the survey. All environmental measurements were below the NIOSH recommended standard and established federal standard for asbestos.

II. DISTRIBUTION AND AVAILABILITY

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies have been sent to:

- a) Federal-Mogul Corporation
- b) Authorized Representative of Employees
- c) U.S. Department of Labor - Region V
- d) NIOSH - Region V

For the purpose of informing the affected employees the employer shall promptly "post" for a period of 30 calendar days the Determination Report in a prominent place(s) near where exposed employees work.

### III. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health received such a request from the Personnel Manager for a health hazard evaluation in the toolroom of the Federal Mogul Company in Gallipolis, Ohio. The request specified only one employee was potentially exposed to asbestos and voluntary monitoring of the work area was desired.

### IV. HEALTH HAZARD EVALUATION

#### A. Plant Process

This plant, employing approximately 200 workers operating on three eight-hour shifts, manufactures automatic transmission parts such as gears and driveshafts for large automobiles. Powdered iron, with approximately 1% zinc stearate or acrawax added as a binder, and less than 1% graphite, is fed automatically into a large press which forms the metal powder into a solid gear or other transmission part. These parts are fragile and are hand carried on a rack to the sintering furnaces. The parts are conveyed through the furnaces either on metal or asbestos belts. Finished parts are all rinsed in a solution of magnaflux and observed under black light to see if any cracks or other imperfections were present.

One employee is potentially exposed to asbestos while cutting asbestos board used as a cover for an induction coil heater. These asbestos boards are used in the plant production area. When one breaks the toolroom fabricates another one, normally they fabricate about two a month.

The fabrications of asbestos boards takes approximately six hours. During this period about 1/2 the time is used for tool setup and the other 1/2 is used in actual milling. The operator produced an almost continuous milling operation during the three hour sampling period.

#### B. Evaluation Design

An environmental survey was conducted on July 11-12, 1979. This survey included obtaining background information and conducting a walk-through survey of the toolroom.

Aerometric sampling was performed. Airborne samples were collected for asbestos.

A non-directed questionnaire designed to elicit symptomatology possibly related to health problems arising from the work environment was completed by the industrial hygienist.

An Interim Report was distributed on July 25, 1979, reporting the findings to date and the future action to be taken.

### C. Environmental Evaluation Method

Personal and general area samples were used to evaluate employee exposure to asbestos. The personal samples were obtained by attaching a battery powered vacuum pump operating at 1.5 liters per minute to the workers' belt with the sampling media (37 mm diameter cellulose membrane filters with an 0.8 micrometer pore size) held open-faced in plastic cassettes attached to the shirt lapel of a worker.

All samples collected were analyzed according to NIOSH P&CAM #239, which utilizes phase contrast microscopy techniques.

### D. Evaluation Criteria

#### 1. Environmental

The NIOSH revised recommended limit for asbestos fibers (Table I) is 0.1 fiber greater than 5  $\mu\text{m}$  in length per cc of air (fiber/cc) based on an eight-hour time weighted average (TWA) with a peak concentration not to exceed 0.5 fibers/cc based on a 15-minute sample period.

The current U.S. Department of Labor (OSHA) standard is 2.0 fibers/cc based on an 8-hour TWA sample and a peak concentration of 10.0 fibers/cc.

#### 2. Physiological Effects

It is well accepted today that asbestos is a hazardous material. Breathing asbestos fibers can directly cause asbestosis and is contributory cause of lung cancer. Lung cancer is more frequently found in workers who are exposed to asbestos and smoke cigarettes than in nonsmokers.

Asbestosis is a lung disease characterized by scarring or thickening of the lung walls. Breathing becomes difficult, thus causing a strain on the heart. Carcinoma associated with asbestos exposures include cancer of the lungs - the most prevalent, cancer of the chest or abdominal lining, cancer of the trachea, and cancer of the gastro-intestinal track. There is a latency period of 20-25 years between exposures to asbestos and development of a tumor with the exposure/disease relationship not being well defined. The NIOSH recommendations were designed primarily to decrease the chance of developing cancer as well as preventing asbestosis among workers exposed to asbestos fibers.

#### E. Evaluation Results and Discussion

Results of environmental samples collected for asbestos are given in Table I. Levels of asbestos ranged from less than detectable limits to 0.08 fibers/cc for both personal and general area samples during two days of normal operations involving the fabrication activities with asbestos board. All levels were below the NIOSH criteria and OSHA health standards.

The health questionnaire revealed that the employee reported no health problems arising from his work environment.

Based on the results of environmental evaluation conducted on July 11-12, 1979 it does not appear that the present degree of operations utilizing asbestos creates a health hazard to the tool and die operator in the toolroom.

#### V. RECOMMENDATIONS

1. The practice of smoking cigarettes while working with asbestos board should be discontinued.
2. Continue the practice of using a portable vacuum system while working with asbestos.
3. A less hazardous substance should be substituted for asbestos if possible.

#### VI. REFERENCES

1. NIOSH Revised Recommended Asbestos Standard, DHEW Publication No. 77-169, December, 1976.
2. OSHA 2206 - Safety and Health Standards 29 CFR 1910, U.S. Department of Labor, January, 1976.
3. American Conference of Governmental Industrial Hygienists, TLV's Threshold Limit Values for Chemical Substance and Physical Agents in the Workroom Environment with Intended Changes, 1978.
4. NIOSH Manual of Analytical Methods, HEW Publication No. 75-121, P&CAM. 239.

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TABLE I

Results Of Environmental Sampling For Asbestos  
 Federal-Mogul  
 Gallipolis, Ohio  
 July 11-12, 1979

<u>Job and/or Location</u>	<u>Date</u>	<u>Sampling Period</u>	<u>Sample Volume (Liters)</u>	<u>Type</u>	<u>Asbestos Concentration (Fibers/cc)</u>
Tool and Die Operator	7-11-79	0835-1043	192	*BZ	0.08
Tool Room	7-11-79	0847-1044	176	**GA	0.03
Tool Room	7-11-79	0847-1044	176	GA	0.03
Tool and Die Operator	7-12-79	0808-1054	249	BZ	0.06
Tool Room	7-12-79	0809-1055	249	GA	0.03
Tool Room	7-12-79	0809-1055	249	GA	***LD

Present OSHA Standard

2.0 f/cc - 8 hour TWA  
 10.0 f/cc - 15 minute ceiling

Recommended NIOSH Standard

0.1 f/cc - 8 hour TWA  
 0.5 f/cc - 15 minute ceiling

\* BZ - Breathing Zone

\*\* GA - General Area

\*\*\* LD - Less than detectable limits

Concentrations of asbestos are given in fibers per cubic centimeter of air (f/cc).

Limits of detection used by the laboratory are based on the lowest concentrations that can be detected which was 0.01 f/cc.