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ROGERS CORPORATION
MOLDED MATERIALS DIVISION
MANCHESTER, CONNECTICUT

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ASBESTOS DUST-IN-AIR SURVEY

On October 27, 1972, in the company of Ed Sweeney and James Lawrence, Loss Prevention Representative, air samples were collected around several operations within the plant in order to determine the concentration of asbestos dust-in-air.

Subsequently, on November 2 and 3, 1972, a team of specialists from Liberty Mutual Insurance Company conducted an evaluation of the asbestos exposure in your plant using a mobile laboratory. This evaluation included additional air sampling for asbestos dust, respiratory function studies on exposed employees, and meetings with management to aid your company in complying with the Asbestos Standard of the Occupational Safety and Health Act.

We took 32 personal and general room air samples for determination of airborne asbestos dust concentrations, and performed respiratory function examinations in our mobile laboratory. The results of our air sampling were reviewed at the plant during the course of our management conference on November 3, 1972.

Conclusions and recommendations in this report are based on the results of the sampling, and on personal observations.

CONCLUSIONS

1. The ceiling Threshold Limit Value of 10 fibers/cc was exceeded in 8 of the 32 samples collected, primarily in the Beater Room, around the kneaders, and in the 735 Extruding Area.

2. The current time-weighted average Threshold Limit Value of 5 fibers/cc was exceeded, at times, in the Beater Room, around the kneaders, and in the 735 Extruding Area.

3. The 1976 proposed time-weighted average Threshold Limit Value of 2 fibers/cc was apparently exceeded in the Beater Room, around the kneaders, in the 735 Extruding Area, and in some areas of the Finishing Department.

4. Immediate engineering controls are indicated in the Beater Room, around the kneaders, and in 735 Extruding in order to reduce dust concentrations below ceiling levels.

5. A respirator maintenance program should be implemented in accordance with ANSI Standard Z88.2-1969.

6. A medical control program should be initiated for all new, current, and terminating employees exposed to asbestos dust concentrations in excess of 1 fiber/cc, as recommended by the National Institute of Occupational Safety and Health in their Criteria document on asbestos.

Included for your further reference is a release entitled, "Asbestos Air Sampling and Analysis Technique".

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12/19/72

RECOMMENDATIONS

1. The exhaust ventilation systems at the kneader feed openings and in 735 Extruding should be evaluated for adequacy. Enclosures should be constructed around the kneader feed openings, if practical.

2. Exhaust ventilation should be provided for the beaters, if pulpable asbestos bags cannot be used.

3. If possible, attempts should be made to provide exhaust ventilation at the discharge from the kneaders, where drums are filled.

4. Adequate make-up air should be provided for all exhaust systems in the plant so that these systems will function properly.

5. The exhaust ventilation systems should be maintained on a regular basis so that any malfunctions can be detected before they become a major problem.

6. All structural and machine surfaces in the plant should be maintained free of accummulations of asbestos-containing dust.

7. The cleaning and removal of dust would best be accomplished by vacuum cleaning rather than sweeping. Sweeping may generate hazardous dust concentrations.

8. Until engineering controls prove effective, respirators approved by the Bureau of Mines under Schedule 21B will have to be worn in areas where dust concentrations exceed the Threshold Limit Value.

9. A respirator maintenance program should be instituted in accordance with ANSI Z88.2-1969.

10. In areas where concentrations of asbestos fibers exceed 10 fibers/cc protective clothing is required. This protective clothing should consist of coveralls and head covering. Respirators are also needed in these areas.

11. Contaminated clothing must be placed in sealed containers for transfer and these containers must be marked with the asbestos warning sign.

12. The laundry facility must be notified if the clothing is contaminated with asbestos dust.

13. Employees who work in asbestos dust concentrations in excess of 10 fibers/cc must be provided with separate lockers for street and work clothes. These lockers should be so arranged that street clothes do not become contaminated with asbestos dust.

14. Warning signs designed in conformance with the National Institute of Occupational Safety and Health should be posted throughout the plant where concentrations of asbestos dust exceed the Threshold Limit Value.

15. In areas where the Threshold Limit Value or ceiling levels may be exceeded, monitoring and evaluation must be performed every six months. This should be done by a properly trained individual.

16. All new employees and those transferred to areas exposed to airborne concentrations of asbestos fibers should come under the requirements of the medical control program, namely:

    a. Pre-placement physical examination within 30 days of the individual's first employment in an occupation exposed to airborne concentrations of asbestos fibers.

    b. 14 x 17 chest x-ray.

    c. Respiratory system questionnaire.

    d. Pulmonary function tests to include forced vital capacity and forced expiratory volume in one second.

It should be noted that any individual who indicates a history of respiratory disease such as asthma, bronchitis or emphysema should be carefully medically evaluated before job placement in an asbestos exposure area.

17. These same medical controls must be performed on all current employees working in these areas.

18. Physical examinations on exposed employees must be provided on a yearly basis.

19. Termination physical examinations must also be provided 30 days before or after termination of employment and should include all of the requirements of the medical control program.

DISCUSSION

The purpose of these surveys was to aid you in complying with the asbestos standard which became effective on July 7, 1972. Air samples were taken to determine dust concentrations and respiratory function tests were performed to fulfill one part of the medical requirements.

The eventual goal of the asbestos standard is to reduce employee exposures to 2 fibers/cc of air for an eight hour working day. If possible, exposure should be reduced below this level.

We believe that through engineering controls, asbestos dust concentrations in most of your plant can be reduced to levels below 2 fibers/cc which is the proposed Threshold Limit Value for 1976.

LOCAL EXHAUST VENTILATION:

Although hoods connected to an exhaust ventilation system have been provided behind each floor opening where the kneaders are charged, the results of the air sampling indicate that these are not adequate to reduce the concentration of airborne asbestos dust at all times. If possible, these openings should be surrounded by walls or barriers on both sides, and the back, and the top, forming what amounts to an open-front booth. This should improve the velocity of air moving into the face of the booth and provide better capture and removal of particulates.

It was noticed during the survey that some material had collected in the exhaust ventilation hoods behind the floor openings above the kneaders. Every effort should be made to keep these hoods clean and clear of built-up material which might interfere with proper exhaust ventilation.

Although exhaust ventilation has been provided for the Witte screen in the 735 Extruding Area, an air sample taken near this unit indicates that there may be some leakage of dust back into the room. Possibly, the system is not properly balanced, and the amount of air blowing through the screen is greater than the exhaust capacity over the screen.

Previous discussions have indicated that it is not possible to use pulpable bags of asbestos in the beaters. Under these conditions, it appears that the asbestos fibers generated by opening and emptying the bags into the beater will have to be captured and removed before they can enter the workroom atmosphere. This might be accomplished by the installation of some type of side-draft or suspended hood, or possibly an open-front booth, connected to an exhaust ventilation system. For the greatest effect, the bags should be opened as close as possible to such a hood, or within the confines of the booth, in order for the asbestos dust to be within the influence of the air moving into the system.

The air sampling indicates that there are times when significant dust concentrations are generated by the employee rolling the mixes from the kneaders into the drums. If it is not possible to design this operation so that it can be done mechanically, perhaps by the use of enclosed conveyors, it appears that local exhaust ventilation should applied at the kneader opening and at the tray above the drums. This may have to consist of some type of overhead canopy hood, with barriers at both sides to better channel the flow of air. For the greatest effectiveness, the hood should be as close as possible to the source of the contaminant.

Changes in existing exhaust ventilation systems, and the provision of additional exhaust ventilation, may well make the provision of make-up air critical. Certainly, no exhaust system will function at its maximum capacity unless adequate make-up air is provided.

In this regard, a company specializing in exhaust ventilation should be consulted about any alterations and/or additions to the systems.

Exhaust ventilation systems should be monitored on a regular basis so that malfunctions can be detected, and corrections made promptly.

HOUSEKEEPING AND FLOOR CARE:

The presence of dust and dirt on equipment, machines, and floors indicates that greater attention should be given to housekeeping, particularly in those areas where asbestos fibers are used or where materials containing asbestos fibers are processed.

It appeared from observation that it was the practice of employees

to use brooms to sweep up asbestos-containing scrap and waste. Vacuum cleaners or a central vacuum should be substituted for brooms to help avoid the unnecessary generation of dust into the work atmosphere. The cleaning of machines, equipment, and structural parts of the buildings should also be done by vacuuming for the same reason.

Another source of dust can be the portable vacuum cleaner itself if the exhaust port is not provided with an absolute filter. Unfortunately, the small respirable fibers can pass through a vacuum cleaner while the visible dust is trapped. The only way to insure that the vacuum cleaner is not itself presenting a hazard to the health of your employees is to have an absolute filter in the exhaust port. Needless to say, this filter needs to be replaced periodically.

RESPIRATORY PROTECTION:

All employees exposed to asbestos dust concentrations in excess of 2 fibers/cc should wear approved respiratory protective devices.

Employees should be instructed to replace their respirators whenever they become dirty. They should also be instructed not to leave respirators and other personal protective equipment in areas where they can become dirty from airborne dust. The use of plastic bags for protective equipment when it is not in use is an acceptable practice.

When the use of permanently assigned respiratory protective devices is instituted, each employee should be issued his own device and instructed in its care. Each employee should also have a clean place in which to store his equipment and this device should be maintained in accordance with ANSI Z88.2-1969.

Each employee has the responsibility of using his respiratory protective device in accordance with the instructions and training he has received from management. Management has the responsibility to see that the equipment is used in accordance with this instruction and training. Each employee is responsible to guard against damage to his equipment. If his device malfunctions or is damaged, it is the employee's responsibility to see that it is repaired or replaced immediately.

Only respiratory protective devices approved by the U. S. Bureau of Mines should be provided to the employees and such devices should offer protection against the airborne asbestos dust concentrations

to which the employee is exposed, in accordance with the Asbestos Standard.

PROTECTIVE CLOTHING:

In areas where concentrations of asbestos exceed 10 fibers/cc, protective clothing is required. The most important requirements are coveralls and head covering which should be provided for each employee.

Visitors and other personnel who enter areas where concentrations exceed 10 fibers/cc should also be wearing protective clothing and head covering. A disposable smock would appear to be sufficient for transient personnel.

LAUNDRY:

The laundry who washes the protective clothing must be notified in writing that the clothing is contaminated with asbestos. The laundering of contaminated clothing shall be done in such a manner as to prevent release of fibers into the atmosphere.

Soiled clothing for the laundry should be placed in plastic bags and sealed and labeled as containing asbestos. The appropriate warning signs should be prominently displayed.

LOCKER ROOMS:

It is the employer's responsibility to provide separate lockers for street and work clothes for all employees exposed to concentrations above the Threshold Limit Value. These lockers should be so arranged that street clothes are not contaminated with asbestos.

At our management meeting on November 2, 1972, this matter was discussed briefly.

WARNING SIGNS:

Signs used to warn against the hazards of asbestos should include the design recommended by the National Institute of Occupational Safety and Health. The Criteria Document for asbestos indicates that the warning signs should be in the form and color shown in figure #1 which is located after the data section of this report.

This type of warning sign should also be on the waste containers, raw materials and laundry bags.

MONITORING PROGRAM:

In accordance with the law a regular monitoring program must be set up both to take air samples of the environment and to continue medical controls. At the time of the visit, we outlined methods of taking samples as well as the methods of analysis. It would be desirable to consider the purchase of the necessary monitoring equipment now so that as improvements are made air samples can be taken to determine their effectiveness.

Attached to the end of this report is a release entitled, "Asbestos Sampling Method and Analysis Technique".

MEDICAL CONTROLS:

As we discussed at the management conference, Liberty Mutual's medical function is to assist you with the implementation of a medical control program and to provide you with the opportunity to complete the necessary pulmonary function tests with the ultimate aim of training an individual in spirometry in order to carry on a testing program in the future.

ROGERS CORPORATION

MOLDING MATERIALS DIVISION

MANCHESTER, CONNECTICUT

DATA

METHOD OF SAMPLING - 37 mm Millipore type AA filters.

METHOD OF ANALYSIS - Counted, using phase contrast microscope.

SAMPLE NUMBER	LOCATION AND REMARKS	FIBERS/cc
117.	Breathing zone of #3 Kneader operator, Herb Lawrence, adding ingredients to kneader, and emptying mix into drums. (mix RX 468A).	2.8
118.	Breathing zone of #1 Kneader operator, Robert MacDonald, adding ingredients to kneader, and emptying mix into drums. (Mix RX 525).	1.8
119.	Breathing zone of 735 extruder operator, Bob Montie. (mix RX 462).	4.1
120.	Breathing zone of 725 extruder operator, Arvid Berens. (mix RX525).	3.4
121.	Breathing zone of 745 extruder operator, Ray Banks. (mix RX 468A).	1.3
122.	Breathing zone of calendar operator, John Wolfe, feeding sheets into calendar (mix MR4100).	1.5

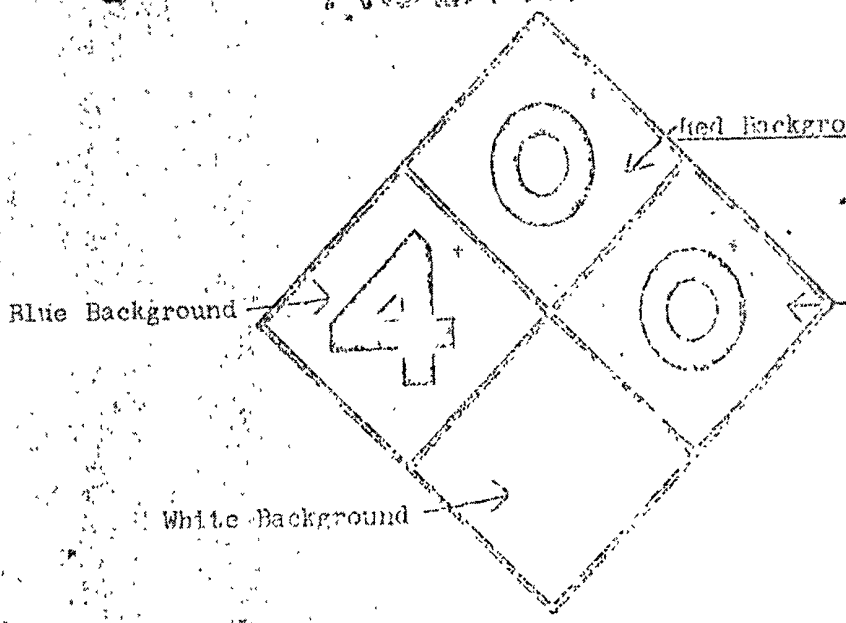
SAMPLE NUMBER	LOCATION AND REMARKS	FIBERS/cc
123.	General room sample at northwest corner of desk in Beater Room - no asbestos added to beater stock.	1.1
124.	Breathing zone of beater operator, Frank Bujaucius - asbestos added to beater stock during sample period. (mix MR4100).	7.4
125.	Breathing zone of beater operator, Sailas Woodward - asbestos added to beater stock during sample period (mix MR4100).	7.0
126.	General room sample at northwest corner of desk in Beater Room - asbestos added to beater stock during sample period (mix MR4100).	2.3
127.	Breathing zone of beater operator, Frank Bujaucius - asbestos added to beater stock during sample period. (mix MR4100)	6.5
128.	Breathing zone of beater operator, Sailas Woodward - asbestos added to beater stock during sample period (mix MR4100)	0.9
129.	Breathing zone of slitter operator, John Cosgrove (mix R435)	2.6
130.	Breathing zone of slitter dryer tender, Francis Kasinski. (mix RM4100)	0.9
131.	Breathing zone of Finish Department scale man, Mike Gardner (mix R435)	2.3
132.	General room sample, about midway between scales and slitter - Finish Department.	2.3
133.	Breathing zone of #2 Kneader operator, Francis Fraizier, adding ingredients to kneader, and emptying mix into drums.	6.8
134.	General room sample in front of air intake filter, opposite column near foot of stairs 735 Extruder basement.	114

SAMPLE NUMBER	LOCATION AND REMARKS	FIBERS/cc
230.	Breathing zone of beater operator, Frank Bujacius, during dumping of 4 bags of 7R-05 asbestos to beater stock (mix R102)	264.
231.	Breathing zone of beater operator Sailas Woodward, during dumping of 4 bags of 7R--05 asbestos to beater stock (mix R102)	546.
232.	Breathing zone of Industrial Hygienist W. R. LaRocque, while touring plant areas - spent about 10 minutes in 735 extruder basement, about 3 minutes in 735 Extruding Department, and about 5 minutes in Beater Room.	23.9
233.	Breathing zone of #1 kneader operator Robert MacDonald, while emptying dry ingredients into kneader and sweeping floor. (mix 468 Black Mix)	38.
234.	Breathing zone of #3 kneader operator, Herb Lawrence raking material from kneader across pan into drums (mix 525)	3.3
235.	Breathing zone of #2 kneader operator, Robert Mac Donald emptying dry charge from kneaders.	262.
236.	Same as sample #235.	700.
237.	General room sample near air intake in 735 Extruder basement.	208.
238.	Breathing zone of #3 kneader operator , Herb Lawrence, adding only dry materials to kneader and sweeping floor.	3.3
239.	General room sample at right front corner of desk, approximately 10 feet from #1 kneader. Ingredients added to mixer and floor swept, (mix 468 Black mix)	1.3

SAMPLE NUMBER	LOCATION AND REMARKS	FIBERS/cc
240.	Breathing zone of #1 kneader operator, Robert MacDonald, raking 468 Black Mix out of kneader into drums.	8.6
241.	General room sample at right front corner of desk near #3 kneader (mix 525)	0.9
242.	Breathing zone of #1 kneader operator, Robert MacDonald hoeing and raking mix from kneader into drums.	7.7
243.	General room sample about 1 foot away from center of Witte screen, between screen and stairs - 735 Extruding.	15.4

FIGURE #1

ASBESTOS



HARMFUL: May Cause Delayed Lung Injury

(Asbestosis, Lung Cancer).

DO NOT BREATHE DUST

Use only with adequate ventilation and approved respiratory protective devices.

* Numbers are in black.