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ROGERS CORPORATION
MOLDING MATERIALS DIVISION
MANCHESTER, CONNECTICUT
ASBESTOS DUST-IN-AIR SURVEY

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ROGERS CORPORATION
MOLDING MATERIALS DIVISION
MANCHESTER, CONNECTICUT
ASBESTOS DUST-IN-AIR SURVEY

On January 20, 1976, in the company of Mr. Ed Sweeney and Mr. Paul Grenier, Loss Prevention Representative, air samples were collected around several operations within the plant in order to determine the concentrations of asbestos dust-in-air and, in turn, to appraise the health hazard to the employees.

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

CONCLUSIONS

1. Based on this sampling, it appears that the provision of an exhaust ventilation hood on the beater in the Beater Room has not reduced the concentration of air-borne asbestos below the present ceiling value of 10 fibers/ c.c. while asbestos fibers are being added to the beater.
2. The concentration of asbestos dust-in-air in the breathing zone of the operator in 735RX Extruding Room remains above the newly proposed value of 0.5 fibers/c.c. for an 8-hour time-weighted average for industrial exposure.
3. The present "ceiling" threshold limit value of 10 fibers/cc was reached in the breathing zone of one Kneader operator, while the concentration in the breathing zone of the other kneader operator reached the present standard of 2 fibers/c.c. for an 8-hour, time weighted average exposure.
4. The newly proposed 8-hour, time-weighted average concentration of 0.5 fibers/c.c. was reached in the breathing zone of the dryer operator.
5. Based on this sampling, additional engineering controls are indicated for the extruders, the beater, and in 735 RX Extruding Room.
6. Until engineering controls prove effective, a respiratory maintenance program should be implemented in the above areas in accordance with ANSI Standard Z88.2-1969.
7. A modified program of medical control is in operation as administered through medical consultant service.

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RECOMMENDATIONS

1. The exhaust ventilation systems at the kneader feed openings and in 735 Extruding should be evaluated for adequacy.
2. The exhaust ventilation hood for the beater should be evaluated for adequacy.
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 accumulations 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 Z88-1969.
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. All new employees and those transferred to areas exposed to any 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.

16. Physical examinations on exposed employees must be provided on a yearly basis, with the Chest X-ray and spirometry supplementals.
17. The physical assessment of each individual should include the determination of medical suitability to wear negative or positive pressure respiratory protective apparatus.
18. 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

As you may know from published reports, the original goal of the asbestos standard was to reduce the time-weighted average concentration to which employees may be exposed to 2 fibers, longer than 5 micrometers, per cubic centimeter of air (fibers/cc) by July 1, 1976. In addition, no employee was to be exposed at any time to air-borne concentrations in excess of 10 fibers/cc. Recently, it has been proposed that these values be reduced to 0.5 fibers/cc and 5 fibers/c.c. respectively. If possible, employee exposure should be maintained below specified levels.

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.

Although exhaust ventilation has been provided for the Witte screen in the 735 Extruding Area, previous experience with this unit indicates that there may be some leakage of dust back into the room, at times. 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, although adjustments have been made since earlier survey.

Consideration might also be given to more fully enclosing the conveyors in the 735 Extruding Area, and possibly providing exhaust ventilation to these enclosures. Transfer points where the mix is dumped might also be enclosed and/or provided with exhaust ventilation.

Previous discussions have indicated that it is not possible to use pulpable bags of asbestos in the beaters. Under these conditions, it was decided that the asbestos fibers generated by opening and emptying the bags into the beater would be captured and removed before they could enter the workroom atmosphere. Attempts were made to accomplish this by the installation of a suspended hood connected to an exhaust ventilation system. This sampling indicates that a high concentration of air-borne asbestos is generated during the dumping of asbestos fibers, and it would be well to inspect this system to make sure it is still functioning within its designed specifications. Consideration might also be given to providing exhaust ventilation at the waste container into which "empty" bags are thrown.

Previous experience has indicated that there are times when significant dust concentrations are generated by the employee hoeing 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 be applied 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.

Only respiratory protective devices approved by NIOSH should be provided to the employees and such devices should offer protection against the air-borne asbestos dust concentrations to which the employee is exposed, in accordance with the 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.

Signs used to warn against the hazards of asbestos should include the one recommended by the National Institute of Occupational Safety and Health.

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

ROGERS CORPORATION
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DATA

Method of Sampling - Personal vacuum pumps and Millipore, type AA filters.

Method of Analysis - Counted, using phase-contrast microscope.

<u>Sample Number</u>	<u>Location</u>	<u>Sample Volume, Liters</u>	<u>Fibers/c.c.*</u>
1.	Breathing zone of kneader operator "L".	258.2	2
2.	Breathing zone of kneader operator "J."	174.6	10
3.	Breathing zone of pre-mix operator "D."	244.0	less than 0.4
4.	Breathing zone of mill operator "C."	220.4	less than 0.4
5.	Breathing zone of grinder operator "M."	212.5	less than 0.4
6.	Breathing zone of utility man "H."	200.8	less than 0.4
7.	Breathing zone of blender operator "L."	155.7	less than 0.5
8.	Breathing zone of beater engineer "B," adding asbestos fibers to beater.	30.2	18
9.	Breathing zone of extruder operator "D," operating 725 system using RK 466 mix.	298.1	0.4
10.	Breathing zone of dryer operator "K."	399.4	0.5
11.	Breathing zone of scale man "F."	216.6	less than 0.4
12.	Breathing zone of slitter operator, "Fr"	188.7	less than 0.5
13.	Breathing zone of extruder operator "Fo," operating 735 system.	156.2	3

*Fibers/c.c. = Number of asbestos fibers, greater than 5 microns in length,
per cubic centimeter of air.