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ROGERS CORPORATION
MOLDED MATERIALS DIVISION
MANCHESTER, CONNECTICUT

SURVEY OF ASBESTOS DUST-IN-AIR

AND

PHENOL VAPOR-IN-AIR

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On May 18, 1972, in the company of Mr. James Lawrence, Loss Prevention Representative, air samples were collected in the breathing zones of employees adding asbestos fibers to the beater in the Manchester facility. The purpose of this survey was to determine the concentration of asbestos dust-in-air and, in turn, to appraise the potential health hazard to the employees. In addition to the breathing zone samples, a general room atmosphere sample was also collected in the 745 RX Room at Mr. Sweeney's request.

Along with the sampling for asbestos dust-in-air, several air samples were collected in various locations about the plant in order to determine the concentration of phenol vapor-in-air and to appraise the potential health hazard to the employees.

CONCLUSIONS

1. The concentration of asbestos dust-in-air in the breathing zones of the employees adding asbestos fibers to the beater exceeded the accepted standard of 5 fibers per milliliter, greater than 5 microns in length.

2. The concentration of asbestos dust-in-air in the general atmosphere of the 745 RX Room was well below the presently accepted standard.

3. The concentration of phenol vapor-in-air in one of the eight samples collected was more than three times greater than the accepted standard of 5 parts of vapor per million parts of air. The concentration of phenol vapor in one other sample, also collected in the 745 RX Room, closely approached the accepted standard.

4. Controls should be established to reduce the concentration of asbestos dust in the breathing zones of the employees adding asbestos fibers to the beater.

5. Medical control program should be initiated for new and present employees exposed to asbestos.

6. It would be desirable to control the emission of phenol vapor into the work atmosphere of the 745 RX Room.

7. Emergency procedures should be drawn up to handle any contamination from phenol.

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RGN/pc

RECOMMENDATIONS

1. In order to reduce the amount of asbestos dust getting into the work atmosphere, it might be possible to place a side-draft or suspended hood, similar in design to those shown in attached Fig. 4-13 at the beater, as close as possible to the station where asbestos fibers are added.

2. Consideration should also be given to providing local exhaust ventilation around the waste drum into which the empty bags, once containing asbestos, are thrown. This would help to capture and remove asbestos dust particles from this source.

3. Information has also been received that it is possible to obtain asbestos fibers in pulpable bags. It might be possible, if a hydro-pulper could be placed in the process flow, to introduce the asbestos fibers earlier in the process so that they would be wet when added to the beater.

4. Medical control should include preplacement and periodic chest x-rays.

5. A specific return-to-work clearance should be adopted for employees absent with respiratory disability.

6. If the above revisions are not possible or practical, the employees should continue to wear their personal respiratory protective devices, which have been approved by the U. S. Bureau of Mines.

7. In order to help prevent unnecessary contamination of the workroom atmosphere, and to reduce the possible irritation to employees, it would be well to consider providing local exhaust ventilation at the two heads of the extruders in the 745 RX Room. The hoods of the local exhaust system should be as close as possible to the extruding heads in order to collect and remove phenol vapor before it has a chance to enter the work atmosphere.

8. A first aid procedure should be established to handle any contamination by phenol.

DISCUSSION

Although the addition of asbestos fibers to the beaters is not done constantly throughout a work shift, the concentrations of asbestos dust-in-air reported under "Data" indicate that asbestos dust does enter the work atmosphere when the bags are opened and dumped and, probably, when the empty bags are placed in the waste container. Since the concentrations found during this sampling were two to three times the accepted standard, during these short intervals, it appears that a potential health hazard might exist for the beater operators, indicating that control measures should be implemented.

One such control would consist of capturing and removing the asbestos fibers before they could enter the workroom atmosphere. In the present case, this might be accomplished by means of some type of side-draft or suspended hood, similar in design to those shown in attached Fig. 4-13. For the greatest effect, the bags should be opened as close as possible to such a hood in order for the dust to be within the influence of air moving into the hoods. Considering that some asbestos fibers may be emitted into the work atmosphere as the bags are crushed and placed into the waste container, it might be possible to provide local exhaust ventilation and a semi-circular hood around the top circumference of the waste container to capture and remove asbestos fibers from this potential source.

A discussion at the time indicated that it was possible to obtain asbestos fibers in pulpable bags, permitting both the bag and its contents to be introduced into the process without the necessity of opening the bags. It appears that these pulpable bags could not be introduced to the beater under present operating conditions; however, it might be possible to introduce a hydro-pulper into the system. The asbestos fibers, along with the bags containing them, could then be introduced to the hydro-pulper and thence to the beater at the proper time. This process would have the advantage of wetting the asbestos fibers before they were introduced to the beater, tending to reduce the amount of dry fibers which are now shaken loose during the manual handling operations.

Asbestos is a significant pulmonary (lung) irritant. The irritation seems to be associated with the physical rather than the chemical composition of asbestos. The fiber size permits easy reach of even the terminal bronchioles upon inhalation. Probably any pre-existing or underlying asthma, bronchitis, or emphysema can be aggravated and would preclude safe job placement. Some of the

pneumoconioses (lung conditions) may only be diagnosed by chest x-ray. Therefore, it would be practical to elicit a careful medical history and conduct a thorough thoracic (chest) cage examination, including chest x-ray, to evaluate any potential respiratory condition apropos to compatible job placement.

It would also be advisable to schedule periodic chest x-rays to determine whether any abnormality may be developing in the course of asbestos atmospheric exposure.

In either instance the 11 x 14 chest plate would be preferable.

Any employee on asbestos operations who is absent with any respiratory illness or disability should secure certification from the attending physician - indicating complete recovery and ability to resume regular work duties.

Any questionable situation should be reviewed with the plant physician at the time of preplacement, periodic, or return-to-work circumstance.

If the above revisions are not possible or practical, the employees adding asbestos fibers to the beaters should continue to wear their personal respiratory protective devices approved by the U. S. Bureau of Mines. It is cautioned that you not require individuals with respiratory problems to wear respirators, as this may reduce their breathing capacity.

The concentration of phenol vapor-in-air reported under "Data" indicate that employees working regularly in the 745 RX Room might find the work atmosphere irritating. It appeared during the survey that employees are not always in the room and that they do not occupy any specific station when they are in the room. On this basis, it appears that they would not be directly exposed to the highest concentration of phenol vapor-in-air found during this survey.

Because of the irritant effects of airborne phenol vapor, however, it would be desirable to prevent unnecessary contamination of the work atmosphere. The sampling indicates that one of the major sources of phenol vapor may well be the extruding heads as the process material enters the work environment. In an effort to capture and remove the phenol vapor as it is produced, consideration should be given to

providing local exhaust ventilation at the extruding heads in the 745 RX Room. Desirably, the hoods of the local exhaust ventilation system should be placed as close as possible to the extruding heads and should surround the heads as much as possible.

Should there be an accidental contamination by phenol, the employees should have definite instructions as to washing and/or removal of contaminated clothing to avoid further absorption through the skin.

ROGERS CORPORATION
MOLDED MATERIALS DIVISION
MANCHESTER, CONNECTICUT

DATA

ASBESTOS

Method of Sampling - Vacuum pump and millipore filters

Method of Analysis - Examined under phase-contrast microscope.

Sample Number	Location	Fibers/ml.
1.	Breathing zone of employee dumping bags of asbestos into beater.	11.1
2.	Same as Sample #1.	16.5
3.	General room atmosphere at breathing zone level - on frame of primary extruder, toward center of room (745 RX Room).	1.0

PHENOL

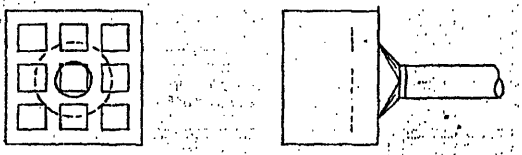
Method of Sampling - Vacuum pump and midget impingers using sodium hydroxide as a collecting medium.

Method of Analysis - Acidified with sulfuric acid. Read on spectrophotofluorimeter.

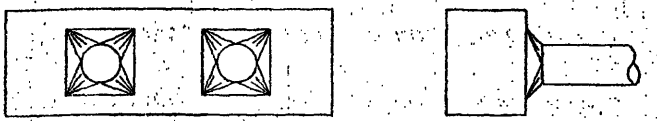
Sample Number	Location	PPM*
1.	General room atmosphere at breathing zone level next to open pail at end of conveyor from extruder #1.	1.1
2.	General room atmosphere at breathing zone level next to open pail at end of conveyor from extruder #2.	1.9
3.	General room atmosphere at breathing zone level to right of extruding head - extruder #1 (745 RX Room).	18.0

Sample Number	Location	PPM*
4.	General room atmosphere at breathing zone level to right of extruding head - extruder #2 (745 RX Room).	4.9
5.	General room atmosphere at breathing zone level between extruder heads #1 and #2 (725 RX Room).	0.5
6.	General room atmosphere at breathing zone level between extruder heads #3 and #4 (725 RX Room).	1.0
7.	General room atmosphere at breathing zone level at edge of barrier along top of chute at "Save-All".	4.0
8.	General room atmosphere at breathing zone level between "Save-All" chute and raised work platform behind "Save-All".	3.3

* PPM = parts of vapor per million parts of air

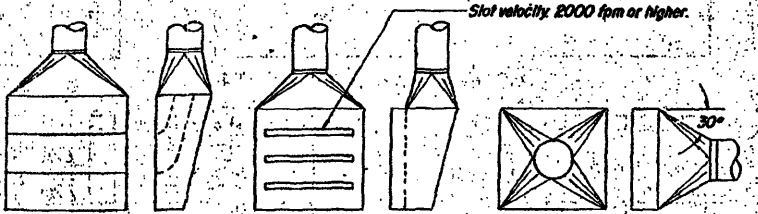


DISTRIBUTION BY BAFFLES
See Fig. 4-16



LONG BOOTHS - DISTRIBUTION BY MULTIPLE TAKE-OFFS and TAPERS

BOOTH-TYPE HOODS
(Same principle apply to canopy type)



DISTRIBUTION BY SPLITTER VANES

DISTRIBUTION BY SLOT (or baffles)

DISTRIBUTION BY TAPER

SIDE-DRAFT & SUSPENDED HOODS

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PRINCIPLES OF MANIFOLD DESIGN	
DATE 1-64	Fig. 4-13

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