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Mr. Woodbury

September 26, 1974

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PERSONNEL

Mr. David B. Woodbury
Foseco Incorporated
20200 Sheldon Road
Brook Park, Ohio 44142

Dear Mr. Woodbury:

The following is a report of an industrial hygiene survey performed at your Mc. Braddock Plant on August 27, 1974. You were present during the survey, along with Mr. G. D. Brandt and Mr. T. Whalen.

I. PURPOSE AND SCOPE:

The purpose of this survey was to measure the prevailing concentrations of airborne asbestos and silica dust at selected plant locations where asbestos or silica materials were being handled. The results were reviewed in order to determine if the concentrations were below the OSHA standard, and if not, to determine the location and extent of any problem. Previous studies by your insurance carrier suggested that a high silica dust concentration had been measured at one of two locations, while no measurable concentrations of asbestos fibers could be found in three locations sampled.

Operations selected for sampling during this survey were those believed to have the greatest potential for asbestos or silica dust generation at this time, and in most cases do not necessarily coincide with those of the insurance carrier. For some operations, only observations and/or ventilation measurements were made due to the fact they were not operating at the time or because of time limitations. Some discussion and recommendations regarding control measures are also included.

II. FINDINGS:

The raw materials of primary concern for this evaluation are amosite asbestos (RM 265A), chrysotile asbestos (RM 319, 319A), silica flour (RM 131B), silica sand (RM 3182, 3183, OOP, OOE), amorphous silica (RM 3553) and diatomaceous earth (RM 544). At the time of the survey, little or no wollastonite was being used. The asbestos counts noted in this report exclude any fiber glass and possible wollastonite found on the filters used to collect the air samples.

Battery operated personal air samplers were used in accordance with OSHA methods to collect breathing zone (B.Z.) samples. The asbestos samples were examined microscopically under phase contrast illumination. The silica dust samples were analyzed gravimetrically and subsequently for free crystalline silica. The free crystalline silica

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II. FINDINGS: (cont'd)

analysis results are used to calculate silica dust Threshold Limit Values (TLV's) for each respective silica dust sample. Attached is a summary of the sampling performed and the results of the analysis.

At the Pre-Mix Operation, two operators work together. Approximately 7 mixes or cycles are accomplished each day. During the survey, one complete cycle of 49 minutes was evaluated. For the first 8 minutes of the cycle, silica flour and diatomaceous earth, among other materials, were loaded at a downdraft grill hopper which feeds to the mixer elevator. For the next 13 minutes, amosite and fiber glass were loaded into the hammermill hopper (downdraft) which conveys the material to the mixer. Previously chrysotile was also used in the mix. A dust separator which is located next to the mixer removes the dust from the exhaust system. For the next 8 minutes, water was added to the batch and the mixer turned on, materials were weighed for the next batch and the dust collector chute was hammered to shake down the dust. A wall fan was operating near the collector chute. For the last 20 minutes, the product containers were loaded and weighed.

Both loading hoppers have a face velocity of approximately 400 fpm. On this basis, the hammermill hopper air flow would be approximately 1600 cfm, while that for the mixer grill hopper would be approximately 2300 cfm. While the face velocity for both hoppers is quite good, the height of the hammermill hopper places it directly in the B.Z., resulting in some probable operator exposure. A personal sampler was worn by each operator during the one cycle of the Pre-Mix Operation. One was used to collect an asbestos sample, the other, the silica dust sample. Results of these two samples (No. 1 and A) are shown on the attached summary.

The OSHA TLV for free silica containing dust is calculated from a formula and varies with the various forms and types of silica contained in a sample. The TLV varies inversely with the free silica content. The free crystalline silica analysis of sample A revealed it contained 23.2% quartz, less than 0.5% of tridymite and 0.8% of cristobalite. Based upon this analysis, the calculated TLV for sample A is 1.2 mg/m^3. The "upper limit" for the TLV for dust containing less than 1% free crystalline silica is 10 mg/m^3, which is also the American Conference of Governmental Industrial Hygienists nuisance dust TLV. The current OSHA nuisance dust level is 15 mg/m^3, but 10 mg/m^3 is the more commonly accepted value.

The current OSHA permissible 8-hour time-weighted average concentration for asbestos fibers is 5 fibers/ml of air. Only fibers longer than 5 microns are to be counted. The ceiling concentration is 10 fibers/ml of air. On July 1, 1976, the 8-hour time-weighted average concentration will be reduced to 2 fibers/ml of air. The ceiling limit will remain the same.

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II. FINDINGS: (cont'd)

At the Sawing Operation, one operator cuts flat board product. Two radial saws are provided with hooded exhaust enclosures. A band-saw which is reportedly seldom used is not provided with any exhaust ventilation. A considerable amount of residual dust was apparent in the general area on surfaces, etc. The operator cuts the boards with a radial saw for 4 to 6 hours per day, approximately once per week. The face velocity of each hood was determined to vary from approximately 250 fpm near the top to 150 fpm near the bottom. Total air flow from each hood would be approximately 600 cfm. The hoods were exhausted outside of the building and were not, it is believed, provided with any dust removal system. The hoods appeared to be effective in controlling dust produced by the radial saw.

At the time of the survey, the operator simulated the normal sawing operation by cutting scrap pieces of board product with a radial saw. A personal sampler was used to collect two consecutive B.Z. samples, one for asbestos, the second for silica dust. Results are shown on the attached summary (samples No. 2 and B). Analysis of sample B for free crystalline silica revealed it contained 35.2% quartz and less than 1% of tridymite or cristobalite. Based upon this analysis, the calculated TLV for sample B is 0.8 mg/m^3.

At the Pulping Platform, one operator loads two mixers, one for Kalmanex and one for Profax. Only the Kalmanex mixer was being loaded at the time of the survey. The operator normally handles and measures the related materials and loads the mixers 8 hours per day. Two types of asbestos, but no silica were being handled or loaded. Ball-mill dust was poured into a loading container in a ventilated enclosure. The exhaust ventilation was provided by a drum-type exhauster with a bag filter which exhausted to the room. Total air flow through the system was measured and found to be approximately 80 cfm. Assuming an "average" face opening during pouring of approximately 2 ft^2, this would provide a face velocity of approximately 40 fpm. It was not effective in controlling the dust.

The asbestos and other RM's were weighed in a canopy type hood with partial sides which was mounted against a wall. Total air flow was measured and found to be approximately 700 cfm. Because of the height of the hood, the effectiveness was poor. The capture velocity at the level of the scale was negligible. The cross-draft at the time was 100 to 150 fpm from the large open door.

A personal sampler was used to collect a B.Z. sample while the operator performed one complete cycle for the Kalmanex mixer, except that four batches of material were weighed under the canopy hood. Since no silica-type RM's were being handled, only one sample was collected for asbestos. Results are shown on the attached summary (sample No. 3).

(cont'd)

>te Operation was reviewed but not sampled, as it was not . Two mixers are provided with a cover to reduce the .ize and are exhausted by means of a drum-type exhauster ag filter. It did not appear to be operating properly blocked, etc.), as the total air flow was determined to approximately 5 cfm. This would provide a face velocity of an 1 fpm. Two types of amorphous silica and 15% of the osite and possibly some chrysotile are loaded.

her operations noted, but not sampled, were the Oven Area t Booth and the Sand Mold Operation. The product is sanded lly in the hood in question. It is exhausted by means of a type exhauster with a bag filter. Silica sand is used in the Mold area. If the silica dust concentration in the area is rmined to be excessive, it would appear to only be a problem re it is handled initially, before it is dampened.

CLUSIONS AND RECOMMENDATIONS

Pre-Mix Operation:

The prevailing B.Z. concentrations of 6.6 fibers/ml of asbestos and 16.8 mg/m^3 of silica dust are considered good approximations of their respective 8-hour time weighted average concentrations. While they are both in excess of their TLV's, the silica dust is excessive to a much greater degree. In fact, it even exceeds the nuisance dust TLV (less than 1% free crystalline silica) of 10 mg/m^3. The dust exposures appear to be most significant during the amosite handling and loading, during dust collector shake-down, during final product loading through open door of mixer, and when handling accumulated empty RM bags. In view of the above, the following is recommended:

a. The cutting and opening of the amosite bags should be performed under local exhaust ventilation conditions. If feasible, consideration should be given to cutting the bags on the downdraft grill hopper located next to the mixer. If too much material would be drawn through the grill, it could possibly be temporarily partially covered. The alternative would be to provide a separate exhaust enclosure for the operation, preferably in conjunction with the hammer mill hopper. A platform or other method is needed so the B.Z. would not be so close to the hopper opening.

b. Either better dust control ventilation should be provided for the collector shake-down or a dust mask should be worn during that operation. The mixer door which is left open should be kept closed. If it is necessary for the operator to see through the opening, plastic sheet could be used to cover it. One of the f not most, significant dust exposures probably

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III. CONCLUSIONS AND RECOMMENDATIONS: (cont'd)

occurs when the operator picks up and carries stacks of empty RM bags. Another procedure should be adopted, or a dust mask also worn for that operation.

2. Sawing Operation:

The prevailing B.Z. concentrations of 56.2 fibers/ml of asbestos and 13.5 mg/m³ of silica dust would not be considered 8-hour averages. Since the operation is performed for 4 to 6 hours per day, the average concentrations could be 1/2 to 3/4 of that reported. The adjusted concentrations would still be well in excess of their TLV'S. The first sample collected for asbestos may be atypical, however, as some dust contamination from the operator's shirt pocket was suspected because of the filter holder position. It was repositioned for the second sample which was collected for silica dust. For this reason, it is felt the asbestos result should be discounted. The higher than expected result for the silica dust, however, is believed to be a result of the dust residual in the room, on cut product board surfaces, etc.; the hoods appeared to be quite effective in controlling the dust from the saw. Another possible factor could be recirculation of the exhausted dust back into the building or general area. It is recommended that the residual dust be reduced through use of a dust vacuum or other method and that the hood exhaust system be provided with a dust collector.

3. Pulping Platform:

The prevailing B.Z. concentration of 13.3 fibers/ml of asbestos is considered an approximation of the 8-hour average when only the one mixer is loaded. If both were loaded, however, the 8-hour average would be expected to be somewhat lower. Most of the asbestos and other types of dust exposure appeared to be most significant during the pouring of ball-mill dust into the loading container, when loading the mixer, and when weighing materials under the hood. In view of the above, the following is recommended:

a. The ball-mill enclosure exhaust system should be checked to see if it is operating at capacity. A total air flow of at least 200 cfm would be needed to be effective.

b. Each mixer (tank) should be provided with exhaust ventilation so as to produce a face velocity at the tank opening of at least 100 fpm. This would require approximately 1400 cfm for each mixer. If the openings were reduced, the required air flow would, of course, be reduced proportionally. (Note: This approach is similar to that depicted in the upper right of the enclosed data sheet VS-304.)

c. The weighing hood should be converted to conform to a lateral-exhaust type of hood with back draft ventilation with a face velocity of 100 fpm.

4. Other:

a. To provide an effective face velocity (100 fpm) on the Moldcote mixers, approximately 400 cfm would be needed for each mixer (with partial cover). Sampling would be necessary to assess the asbestos and silica dust exposure levels.

b. From a general standpoint, additional procedures should be considered to reduce the level of general floor and surface dust in the plant. Wherever asbestos or silica dust levels were found excessive, dust respirators should be provided and worn until measures are taken to reduce the concentrations and sampling confirms they are at safe levels.

Sincerely yours,

Thomas A. Bozich
Industrial Hygiene Consultant

att. Summary (2p)
VS-304