

T. B. BONNEY
PITTSBURGH OFFICE

MR. C. P. FURNEY
ALCOA TECHNICAL CENTER

February 26, 1975

cc: J. M. Plunkett - Alcoa Technical Center

RE: A-560 PROCESS - ASBESTOS EXPOSURES

Attached is a copy of John Plunkett's report concerning the captioned. Although the fiber concentrations measured in the laboratory tests won't necessarily be the same as those that will exist under actual plant conditions, they very adequately point out the potentially troublesome areas. Of greatest concern, by far, is the possibility of the coating material accumulating on the floor (as a result of overspray) and becoming a source of airborne asbestos fibers. By any standards, contaminating a work area with asbestos-containing materials is an intolerable situation.

Whether or not the spray application, per se, of the coating will produce excessive concentrations of airborne fibers is conjectural at this point. The measured 0.4 fibers/cc is not too far below the 2 fibers/cc standard that will be effective July 1, 1976. The gun that is ultimately selected for in the plant use, the geometry of the metal to be coated, and the manner in which the coating is applied may all be factors in determining the asbestos fiber concentrations in the breathing zone of the applicator.

Even if spray application does not produce excessive concentrations, you will still have to contend with Paragraph 1910.93a (c)(2)(iii) of the OSHA Regulation which requires the applicator to use an air supplied respirator and wear special clothing. It very likely will be quite difficult to obtain a variance that would allow you to operate without these requirements. Of course, the mere presence of asbestos in the working area also requires semiannual air monitoring (both personal and area sampling), posting the area, cautionary labeling of the coating containers, keeping external surfaces free of accumulations of the coating, special waste disposal procedures, and annual medical examinations of all exposed personnel.

Because of the restrictive nature of the asbestos standard and the very real potential of excessive exposures, we feel that it is judicious to seek a less toxic substitute for the asbestos component.



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FROM

JOHN M. PLUNKETT
ENVIRONMENTAL HEALTH LABORATORY
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TO

MR. T. B. BONNEY
PITTSBURGH OFFICE

February 24, 1975

RE: A-560 SPRAY COATING AT ATC - BUILDING C; LAB BENCH SCALE
ROOM 2442 SPRAY BOOTH

GENERAL

The principle objective of the tests was to determine if a potential asbestos hazard exists by the spray application of the A-560 coating material. Another objective was to determine if asbestos was liberated from hardened overspray on the floor as it was broken up by traffic, etc., and released into the atmosphere. Experiments were set up by Mr. Karl Karsten of the Surface Chemistry and Coatings Division. All spray booth ventilation in the room was turned off during tests. The coating material is JM Fibrous Adhesive, a sodium silicate filled with asbestos fibers; as received, it is of a thick consistency like glazing putty. The material was reduced 20% with water for easier spraying.

The spray gun purchased for this application is expected to be used in plant trials. Binks Model 69 nozzle designation; Binks Model 80 container.

Metal used in tests was aluminum extrusions 30" long, T-shaped, with the vertical section to be coated.

Samples were collected using 37mm field monitors and the MSA pump at a rate of 2.22 LPM. The system was calibrated prior to use. Minimum time for each test was set at 15 minutes.

Counting for asbestos fibers was performed by R. Geiger and the writer.

Sample #1

Considered an aborted sample; spray gun problems with approximately 2 minutes interrupted total spraying time.

The coating material contained black lumps which would plug the nozzle. Also air adjustment of the gun was hit or miss.

Mr. Karl Karsten was to screen the material and experiment with the operation of the gun prior to the next test.

Terminated sampling after six minutes.

No evidence of dust or foreign material in the area around the operation during sprays, only gobs of the materials.

R. Geiger and the writer scanned a slide made from the filter and could find no fibers, only crystal-like particles.



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Sample #2

Prior to this test the adhesive coating was screened through window screening but did not flow, thus had to be forced through, perhaps breaking up fibers.

During this test there was approximately 5 minutes of total spraying time during which there were four stops of about 1 minutes each to keep gun in operation. The gun would clog and slamming it on the table would put it back in operation! When it did work a spray similar to a coarse spray from a garden hose would emerge.

The sample was collected for 15 minutes uninterrupted and the filter showed a few spots of the coating.

A slide prepared from this sample examined and counted for asbestos fibers showed a concentration of 0.4 fibers/cc. Many crystals of varying sizes was noted in all fields but our estimation indicated most of them well over 5 microns in size.

Examination of a spot of coating on the filter showed a very large crystal; we were unable to distinguish if asbestos fibers were present in this crystal.

Sample #3

This sample was collected to simulate the possible breakup of hardened overspray by traffic, etc., to determine if asbestos fibers would be released to atmosphere.

Approximately 5 grams of the dried overspray was taken from a piece of aluminum sheet and placed on an aluminum plate. This material was broken up by rolling and crushing and then stirred about the plate during the period of sampling. No visible dust was observed in the atmosphere.

The breakup was quite difficult, the original flakes of overspray were about 0.5 cm in thickness and very hard.

The sample was collected for a 15 minute period, 8" above the plate.

The ground up material was saved; the appearance would seem to be fibrous, even one conglomerate of fibers was noted.

A slide prepared from this sample examined and counted for asbestos fibers showed 0.02 fibers/cc. Here again many crystals were noted in all fields.

In general, of the 19 fibers counted in a total of 200 fields of samples #2 and #3, approximately 4 or 5 were considered free normal asbestos fibers, all the others were encased in the silicate crystalline material. Most of the encased fibers were estimated to be quite large when compared to the 5 micron diameter circle of the reticle in the microscope system.

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Sample #4

The vial of ground overspray obtained from Sample #3 was shaken vigorously and the resulting fine dust cloud collected on a field monitor using the MSA pump.

The object was to determine if the fines in the dust cloud contained asbestos fibers. No quantitative determination was planned.

A slide was prepared and examined by microscope at 450X. Scanning showed a large number of asbestos fibers larger than 5 microns. However, many fibers were below 5 microns in length. The majority of material noted were crystals, assumed to be the silicate. Sizes of these crystals were mixed but an estimation is that the majority were under 5-10 microns in diameter.

Because of the large number of asbestos fibers found in this sample and if plant operations were similar, i.e., overspray of the material allowed to harden on the floor, traffic to break it up, followed by clean-up by sweeping, a potential asbestos hazard could be present.

Special provisions to eliminate these conditions, specifically a method of containing the overspray, must be made a mandatory part of the process.


JOHN M. PLUNKETT

JMP:ds