

J. DAMIANO
SAFETY DEPARTMENT
ALCOA TECHNICAL CENTER

MR. T. J. RODJON
FACILITIES ENGINEERING
ALCOA TECHNICAL CENTER

1979 November 06

RE: INDUSTRIAL HYGIENE ASPECTS OF REMOVING INSULATION
CONTAINING ASBESTOS FROM THE COIL SHEET COATER

Per your request of 1979 October 26, we have prepared recommended procedures for the removal of lagging containing asbestos from the Packaging Division coil sheet coater.

We would be glad to answer any questions you may have.

Joseph Damiano

J. DAMIANO

bs

Attachment

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INDUSTRIAL HYGIENE ASPECTS OF REMOVING INSULATION CONTAINING ASBESTOS FROM THE COIL SHEET COATER

Toxicity of Asbestos

Asbestos has been identified as the causative agent of asbestosis and has been associated with an increased incidence of cancer. Exposure to asbestos does not necessarily lead to deleterious health effects for the individual, but does lead to a significantly increased incidence of such effects for an exposed population.

Asbestosis is the predominant illness attributable to inhalation of asbestos fibers. The disease manifests itself following exposures of either high asbestos concentrations for short time periods or, more commonly, low levels for prolonged time periods. Although asbestosis may become evident in as little as 18 months, the average latency period is 17 years. In asbestosis, fibrosis or scarring of the lungs develops rapidly, is not halted with the cessation of exposure to asbestos and may ultimately lead to death. Asbestos exposure has been associated with an increased incidence of bronchogenic (lung), mesothelial (malignancy of the chest or abdominal cavities) and gastrointestinal cancers. Cigarette smoke is a suspected "co-carcinogen" for bronchogenic cancer. That is, it has been demonstrated that the risk of dying of lung cancer is 92 times greater for an asbestos worker who smokes, than for an individual who neither smokes nor works with asbestos. The inhaled concentrations known to induce cancer have not been established. Present knowledge, however, indicates that a level approaching zero exposure is required to prevent cancer.

Objectives

- A. To minimize employee exposure to asbestos dust.
- B. To isolate and contain asbestos contamination to avoid unnecessary exposure of personnel not directly involved in the project.

Recommended Procedures

A. Employee Notification

- ✓1. Packaging Division and contracting personnel should be instructed in the potential health effects of asbestos and the control methods described in the following paragraphs. I will conduct these discussions if you would please coordinate the scheduling with the contractor's personnel. I will also be glad to conduct similar discussions for Packaging Division personnel.

*More detail
in initiation*

B. Personal Protection and Hygiene

- ✓1. Employees engaged in insulation removal and any other employee required to enter the restricted areas should don before entering:
 - a) disposable coveralls
 - b) disposable shoe coverings taped at the pant cuffs
 - c) cotton gloves taped at the sleeves
 - d) disposable head covering
 - e) half mask chemical cartridge respirator with high efficiency filters.
- ✓2. Smoking materials, food and drinks should not be permitted in the restricted area.
- ✓3. Before leaving the restricted area, employees should vacuum the protective clothing, remove the head covering, unzip the coveralls and carefully peel the coveralls off, with glove and shoe coverings remaining attached to the coveralls. The respirator is taken off last. Disposable protective clothing and used filter cartridges should be disposed in plastic bags, appropriately labelled for asbestos waste.
- ✓4. Respirators should be cleaned and sanitized at the end of every shift.
- ✓5. Employees should wash their hands, face and arms before eating, drinking or smoking.
6. Change Rooms: OSHA 29 CFR 1910.1001(d)(4) requires change rooms for fixed places of employment and this is not a requirement for contracted personnel.
7. Employees engaged in asbestos removal should be instructed to wash their hands and face before leaving work.

C. Work Practice Controls

1. Restricted Area: The asbestos work area should be delineated with tape or rope and entrance signs should be posted that conform to the requirements of 1910.1001(1)(ii). Entry should be restricted to authorized personnel only wearing the protective clothing described in Section B.
- ② Building A general ventilation systems should be adjusted or closed to avoid dispersal or distribution of asbestos dust out of the restricted area.
3. Plastic curtains should be used to drape and/or enclose the asbestos work area.

4. Plastic sheeting should be used where insulation may fall through floor gratings or may otherwise be deposited in areas difficult to clean.
5. The use of hand operated or power tools including saws, scorers, abrasive wheels, and drills should not be permitted.
6. Only thoroughly wet insulation should be removed. In the process of removal, when any insulation becomes exposed, a fine water spray should be used. The same procedure should be repeated until all visible insulation particles have been removed from the equipment.
7. The insulation should be bagged as it is removed, rather than permitting it to fall for cleanup at a later time.
8. Surface contamination should be cleaned by vacuuming and/or wet sweeping. Dry sweeping should not be permitted. Caution is advised in the selection of vacuums. Conventional vacuums may not be effective in filtering asbestos and may only serve to exhaust the dust. An industrial vacuum equipped with a high efficiency particulate air (HEPA) filter is recommended. High efficiency vacuums for toxic substances are commercially available.

D. Environmental Surveillance

1. Employee "breathing zone" and "general area" air samples should be obtained at select intervals throughout the operation.
- ② Once removal of the coil sheet coater is complete, industrial hygiene personnel should collect surface dust samples to assess contamination.

E. Medical Surveillance

1. Employees engaged in asbestos removal should be provided with the medical examinations specified in 29 CFR 1910.1001(j) including the appropriate chest x-rays and pulmonary function tests.
2. The medical examination should determine those employees whose physical condition prevents the use of respirators.

F. Waste Disposal

1. Insulation waste, scrap, debris, asbestos contaminated clothing consigned for disposal and asbestos contaminated equipment should be disposed of in sealed plastic bags or other impermeable containers.

2. Bags and containers should be labelled:

CAUTION
CONTAINS ASBESTOS FIBERS
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM

JD/bs
1979-11-08

FROM ROBERT J. ORMESHER
INGOT CASTING DIVISION
ALCOA TECHNICAL CENTER - B

TO MEMORANDUM

1980 October 15

RE: REMOVAL OF ASBESTOS CONTAINING LINING FROM FURNACES

Most of the furnace equipment presently in service in the Ingot Casting Division was designed, fabricated and/or purchased during an era when most of the best insulating and refractory lining materials contained asbestos. Some of these pieces of equipment have recently been relined with asbestos free materials, but many still have the asbestos containing materials in place. Relining, remodeling, or even scrapping these items requires some special procedures to prevent asbestos exposure of either the worker or of non-involved employees. This memo details the special procedures that must be followed under these circumstances.

Initial site preparation involves taking precautions to contain entrained asbestos fibers to the immediate work area. In the case of a melting furnace, a total enclosure made of plastic sheeting is required. It has to be erected in such a manner that it can be dismantled, when the old lining has been removed, so that all the dust is contained. Attaching the plastic to the inside of a lumber frame is recommended to allow for easy removal and packaging in approved containers. The size of the enclosure must be large enough to contain the power equipment, an approved vacuum cleaner, and several 55 gallon specially marked steel drums.

The crews working in the enclosure must wear special protective clothing and use special equipment. Disposable coveralls, gloves, hair covering (under the hard hats) and respirators approved for asbestos must be worn at all times when work is in progress in the enclosure. The coveralls are to be taped at the ankles and wrists. All disposable clothing is to be removed and discarded each time a workman leaves the work area. Shoes must be wiped with a damp rag or vacuumed so that the area outside the enclosure is not contaminated. Before leaving the contaminated area for any reason, the workmen shall vacuum the protective clothing, remove the head covering, unzip the coveralls and carefully peel them off, with gloves and shoe coverings remaining attached. The respirator is removed last. The disposable clothing and used filter cartridges shall be disposed of in plastic bags, appropriately labeled for asbestos waste. Respirators shall be cleaned and sanitized at the end of every shift. Workers must wash all skin surfaces that have been exposed to asbestos before eating, drinking, smoking or leaving work. Any water that is used for these purposes must be placed in plastic bags and then into the drums with the contaminated clothing. No smoking or eating is permitted while in the enclosure.

Memorandum
1980 October 15
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During the removal of phosphate containing refractories the use of water as a dust suppressant is not permitted. It is possible to form several very undesirable gaseous reaction products with the water. Because of this, the general practice of not using water has been adopted. Hydraulically driven hammers or jack hammers with totally enclosed air systems rather than the standard pneumatic jack hammer must be used for removing the refractory lining. Removal of the asbestos containing insulation is best done with pry bars having a vacuum nozzle running continuously at the breakaway point. This material shall be bagged as it is removed rather than permitting it to pile up for cleanup at a later time. The objective for doing this carefully and effectively is to prevent contamination of non-asbestos refractory materials which must also be disposed of as asbestos.

The cleanup of the enclosed area after the lining materials have all been placed in the properly marked containers must be thorough. The inside of the plastic enclosure, the furnace shell, both the inside and outside surfaces that could be dusty, and finally the floor must be cleaned with the special vacuum cleaner. When this is all completed, the plastic sheeting can be taken down, continuously folding the contaminated side to the inside, and placed in a drum for disposal.

The disposal of all asbestos containing waste material as well as contaminated material requires special procedures. Asbestos containing insulation, contaminated refractory rubble, the used disposable clothing, loose material picked up with the vacuum cleaner, wiping rags, rinse water from the wiping rags, and finally the plastic enclosure sheeting must be packaged in plastic bags and then sealed in specially marked steel drums. All plastic bags and sealed steel drums shall be affixed with labels that read:

CAUTION
CONTAINS ASBESTOS FIBERS
BREATHING ASBESTOS DUST MAY CAUSE
SERIOUS BODILY HARM

Labels with this wording are available in ATC stores. These drums must then be disposed of in an approved land fill. Most land fill facilities cannot accept this kind of waste so there is an incentive to completely fill the drums (the last waste from an Ingot Casting furnace had to be shipped to Alabama at a cost of almost \$80/drum).


ROBERT J. ORMESHER

RJO:pm

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J. R. Stemler, ATC-C
J. E. Devine, ATC-D
A. B. McKee, ATC-C
R. L. Schonbachler, ATC-D

R. D. Blackburn, ATC-B
L. Resch, ATC-B
Information Copies to:
A. J. Sartshev, Pgh
E. B. Perry, Pgh
E. L. Rooy, Pgh

FROM J. DAMIANO
SAFETY DEPARTMENT
ALCOA TECHNICAL CENTER

TO DR. R. MILLER
INGOT CASTING DIVISION
ALCOA TECHNICAL CENTER - B

1981 January 30

RE: AIRBORNE ASBESTOS MONITORING RESULTS
Ref: Dismantling of 10,000 Pound Furnace

The 10,000 pound furnace was dismantled by contractors 1980 December 02-09. All asbestos related activities were performed in a full containment; the contractors wore appropriate personal protective equipment. The furnace enclosure itself was dismantled 1980 December 10-12.

During the entire operation, air samples were obtained by Ingot Casting Division personnel in order to evaluate the protection afforded by the furnace containment. The test results (Table 1) vary from 0.02 to 0.21 fibers/cc at the indicated work areas outside of the enclosure. Background concentrations determined 1980 September 25 vary from 0.02-0.03 fibers/cc. The OSHA permissible exposure limit is 2.0 fibers/cc as an 8 hour average and 10.0 fibers/cc for any 15 minute period. We can conclude from these data that the containment was effective in protecting our personnel.

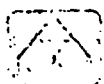
Please contact me with any questions that you may have.


J. DAMIANO

JD:mbm

Attachment

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ID, ATC-D



ALCOA

Ingot Casting Laboratory
Alcoa Technical Center-B

TABLE 1

AIRBORNE ASBESTOS MONITORING RESULTS
DISMANTLING OF 10,000 POUND FURNACE

<u>Sample Number</u>	<u>Date</u>	<u>Sampling Duration (minutes)</u>	<u>Location</u>	<u>Asbestos Fibers/cc</u>
3697-1	80-12-02	337	Unit 4 Instrument Panel	0.20
3697-2	80-12-02	378	Unit 5 Instrument Panel	0.04
3697-3	80-12-02	375	Locker near Preheat Furnace	0.07
3697-4	80-12-03	427	Unit 4 Instrument Panel	0.20
3697-5	80-12-03	428	Unit 5 Instrument Panel	0.03
3697-6	80-12-03	428	Locker near Preheat Furnace	0.04
3697-7	80-12-04	429	Unit 4 Instrument Panel	0.05
3697-8	80-12-04	430	Unit 5 Instrument Panel	0.03
3697-9	80-12-04	430	Locker near Preheat Furnace	0.14
3697-10	80-12-05	433	Unit 4 Instrument Panel	0.21
3697-11	80-12-05	432	Unit 5 Instrument Panel	0.09
3697-12	80-12-05	431	Locker near Preheat Furnace	0.04
3701-1	80-12-08	440	Unit 4 Instrument Panel	0.06
3701-2	80-12-09	443	Unit 4 Instrument Panel	0.06
3701-3	80-12-10	459	Unit 4 Instrument Panel	0.13
3701-4	80-12-11	425	Unit 4 Instrument Panel	0.06
3701-5	80-12-12	470	Unit 4 Instrument Panel	0.02

NOTES:

1. All asbestos work performed by contractor in full enclosure; enclosure dismantled 1980 December 10-12.
2. All air samples obtained at indicated work areas outside furnace enclosure.
3. Monitoring by M. Obey and R. Patz.
4. OSHA Asbestos Standard:
2.0 fibers/cc, 8 hour average
10.0 fibers/cc, any 15 minute average