

PLAINTIFF'S
EXHIBIT
AL-831

61. General correspondence
regarding asbestos
replacement - construction
materials

Construction Materials
Asbestos replacement

611

Elle Sasinoski

F I L E

1982 Sept. 22

MR. J. B. FERRAZ
SAO LUIS, BRAZIL

RE: JOAN E. SANDER'S 1982 SEPT. 10 LETTER --
PRECAUTIONARY MEASURES FOR FABRICATION OF
ASBESTOS FIBRE-CEMENT ROOFING AND SIDING

Enclosed you will find the booklet which I
promised to forward to you, "Recommended
Work Practices for Field Fabrication of
Asbestos-Cement Sheet".

If we can be of any further assistance, please
do not hesitate to call Joan on Ext. 2597.

Elle Sasinoski
ELLE SASINOSKI
Secretary to Joan E. Sander

/eds
Attachment

D R A F T

JOAN E. SANDER
PITTSBURGH OFFICE

MR. R. D. SCHULTZ
SAO PAULO, BRAZIL

MR. J. B. FERRAZ
SAO LUIS, BRAZIL

1982 September 07

RE: PRECAUTIONARY MEASURES FOR FABRICATION OF
ASBESTOS FIBRE-CEMENT ROOFING AND SIDING

Ref: R. Sharkey/E. E. Rumberger's 1982 August 31 Telegram

Earl Rumberger has asked me to ^{outline} ~~forward you information on~~
precautionary steps to ^{observe} ~~follow~~ during the fabrication of ^{the} ~~this~~
asbestos-cement material ^{to be used in the} ~~for the~~ construction of Building 035.

Because working with asbestos products involves a real and serious potential health hazard, certain recommended work practices and procedures should be followed to minimize employee exposures to asbestos dust. For all fabrication operations, one must assume that airborne asbestos concentrations are excessive unless air monitoring demonstrates otherwise. To control these asbestos exposures, I have offered some suggestions below, and have enclosed some booklets which I hope will be helpful to you.

I. WORK PRACTICES

- A. Good housekeeping should be followed to maintain a working environment free from the accumulation of asbestos dust.
- B. Clean-up of asbestos dust should be performed by vacuum cleaners or wet methods to prevent generation of dust clouds. Loose material should never be dry swept.

(MORE)

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- C. The asbestos waste and scrap material should be disposed of in impermeable sealed bags or containers.
- D. The enclosed booklet, "Recommended Work Practices for Field Fabrication of A-C Sheet", offers some guidelines for fabrication of asbestos materials. This booklet is published by the Asbestos Information Association and is a good reference for specific procedures involving the different types of operations involved in the construction process.

II. PERSONAL PROTECTIVE EQUIPMENT

A. Respirators

- 1. Since exposure levels are unknown, but likely to be excessive, respiratory protection will be required of those involved in the fabrication of the fiber-cement roofing and siding.
- 2. There are several respirators suitable for the control of asbestos dust. The enclosed 3M brochure illustrates three such respirators: the 3M 8710, 9900, and 9910. There should be comparable products available in Brazil.

B. Protective Garments

- 1. Further asbestos exposure to the worker or his family may result from wearing the asbestos-laden clothing home and, also, in the laundering of the work clothes. To prevent this type of exposure, those employees working in areas which may produce visible asbestos dust with

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B. Protective Garments (Cont.)

subsequent accumulation on the clothing should be provided with protective garments.

2. DuPont manufactures Tyvek[®], a spunbound olefin used in disposable protective garments as a barrier against asbestos dust. Their Sao Paulo Office will be glad to assist you in locating vendors who sell protective garments made of Tyvek[®]. I am enclosing some literature on the product for your information. For further assistance, you may contact:

J. T. Muniz
DuPont Company
Do Brasil S.A.
Al. Itapicuru 506
Cixa Postal 26
Alphaville 06400
Barueri, Sao Paulo
Telephone: 11-421-8229

III. RECORDKEEPING

Fibers of asbestos in asbestos-cement sheet products are normally "locked in" to a cement binder. However, during fabrication and demolition operations, there is a significant potential for fiber generation. With future considerations in mind, it is imperative to maintain accurate records as to where asbestos products have been used in construction. This will help to insure that proper precautionary measures are followed during modification, demolition, etc., of the areas using A-C sheet products.

(MORE)

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J. B. Ferraz
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If I can be of any further assistance, please do not hesitate to
call me in the Pittsburgh Office at 412/553-2597.

JOAN E. SANDER

JES/eds
Enclosures

FROM E. E. RUMBERGER

TO

PITTSBURGH OFFICE

1982 February 16

RE: ASBESTOS REPLACEMENT

The attached Asbestos Replacement Report is being distributed to plant Department Managers and Superintendents for Engineering, Procurement, Safety, Environmental Control and Industrial Hygiene. It comments on successful and unsuccessful substitutes for asbestos.

Considerable progress has been made in the plants over the past two years in implementing safer substitute materials. This report should be helpful to you in knowing the results of the experiences at the other plants. It might also serve as a useful guide to be used in your next staff meeting to explore your success in making your plant as free from asbestos-containing materials as possible.

We are asking that plant Engineering and Procurement Managers keep us advised of their results in seeking safer substitute materials. This will permit us to share the information throughout the plants. The very worthwhile efforts being made in the plants are much appreciated.

E. E. RUMBERGER

EER:mlf

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Industrial Hygiene Technical Bulletin

NO. 82-3

Date: 1982 February 16

RE: ASBESTOS REPLACEMENT

The Asbestos Replacement Program was initiated a number of years ago as a result of the health hazards associated with handling asbestos and asbestos-containing materials. The program is a cooperative effort between Production, Engineering, Procurement, Research, Safety and Industrial Hygiene at the plant and corporate levels. It continues to be Alcoa's objective to replace all asbestos with safer substitutes whenever possible.

The only exception is that we do not encourage the immediate removal of affixed asbestos insulation so long as it is in good condition. When it does become necessary to replace worn asbestos-containing materials, safer substitutes should be used. When asbestos is being removed, proper precautions must be taken to protect employees from inhaling asbestos fibers.

Considerable progress has been made in the past two years toward making Alcoa plants asbestos free. The attached report summarizes plant experiences and identifies successful substitutes. It also identifies unsuccessful products that have been tested and failed. The report contains sections on General Applications, Potroom Use, Carbon Bake Use, Wire, Rod and Bar Use, and a List of Asbestos Replacement Manufacturers. This report should benefit each plant based on the experience in other plants.

To continue to coordinate these efforts, it is important that Engineering and Procurement at each plant copy the Corporate Industrial Hygiene Division on all efforts made towards asbestos replacement . . . whether positive or negative results occur.

Please review this present status report and advise us of any new experiences at your location. If we can be of any further assistance, please let us know.

SCOTT M. ANDERSON

SMA:mlf

Distribution: See Page 2

INDUSTRIAL HYGIENE TECHNICAL BULLETIN 82-3

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Distribution:

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Engineering Managers

Procurement Managers

Safety Managers - Domestic and International

Environmental Control Contacts

Industrial Hygienists - Domestic and International

Industrial Hygienists - Other

Industrial Hygienists - Pittsburgh Office and ATC

Attachment

ASBESTOS REPLACEMENT PROGRAM

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ASBESTOS REPLACEMENT PROGRAM

GENERAL APPLICATIONS

Material & Use

Belting for Drip
Casting

Replacement Status

Fiberseal Fabric was tested and found to be inadequate.

Block or Brick
for furnaces

Ceramic fiber refractory block is an acceptable substitute. There are no asbestos products currently being installed in melting furnaces, holding furnaces, or heat-treat furnaces.

Brake Linings

A possible (but untested) replacement for asbestos brake linings is RF-28-3D Truck Blocks (4602-FF) from Limpco Manufacturing in Greensville, PA.

Cement Patch for
Boiler Maintenance

Two grades:

1. Hydraulic-setting cement - contains mineral wool and Portland Cement; temperature range up to 1000°F.

Suppliers:

- a) Johns-Manville "375"
- b) Keene Corporation "Super Powerhouse"
- c) 48 Insulation "Quick-Set Cement"

2. High-Temperature Grade - contains mineral wool; temperature range 1000°F to 1900°F.

Suppliers:

- a) Johns-Manville "360"
- b) Keene Corporation "Super 1900"
- c) 48 Insulation Super "48"

ASBESTOS REPLACEMENT PROGRAM

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Material & Use

Cloth and Paper
for Insulation
and Welding
Protection

Replacement Status

Cloth substitutes include: Pyrotek Fabrics, Refrasil, Nor-Fab, Kelnit Welding Blankets

Paper Substitute: Johns-Manville - Cerawool Paper
(Note: Paper should not be used for welding protection.)

Gloves

Flame-resistant terrycloth gloves can be used for temperatures up to 700°F. Some substitutes successfully used at ATC include Kevlar Mittens (up to 400°F) and Kevlar Gloves (up to 900°F). These products are available from Kranso Glove & Mitten, Milwaukee, or A-Best Products, Cleveland. Other products are Kelnit 29, Keller Gloves, Pyrotex, Textoglass Gloves, and Pre-ox Gloves.

Marinite and Marinite
Floats for Molten
Metal Casting

For most HDC and FDC ingot operations, Johns-Manville's (J.M.) asbestos-free Marinite-C board should replace the asbestos Molten Metal Marinite. The applications for Marinite-C include molten metal transfer troughs, baffles, basins and floating skimmers. In certain applications, an acceptable alternate for Marinite-C is Pyrotek's asbestos-free Pyrotherm B-3 manufactured by Cape Boards of England. Johns-Manville's asbestos-free Marinite-I is not recommended for molten aluminum operations.

(Marinite is continued on Page 3.)

ASBESTOS REPLACEMENT PROGRAM

(Page 3)

Material & Use

Replacement Status

An asbestos-free material for the critical HDC and FDC header applications (sheet ingot headers at Tennessee South Plant and Warrick, Hunter caster tips at Badin, small round HDC headers at Badin, and tool and jib plate headers at Vernon) has yet to be developed for commercial use. Until this product is available, we will continue to use asbestos header grade molten metal Marinite.

Almost all asbestos uses in FDC ingot operations can be replaced by Alcoa's R-680.

Pump Packing

In most cases, pump packing materials are bonded in rubber or some other coating compound. These usually generate little potential for fiber exposure and need not be substituted. However, some packings, such as uncoated, noncompressed, braised asbestos may offer a potential for exposure and should be replaced. The plant industrial hygienist should be consulted when there is a question of whether or not a material should be replaced.

Since specific needs and equipment types vary dramatically, pump packing and general packing materials are purchased at the plant level. Suitable replacements should be sought by plant Purchasing by direct contact with manufacturers and suppliers.

ASBESTOS REPLACEMENT PROGRAM

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Material & Use

Rope for packing
and sealing

Replacement Status

Fiberseal A-1 Rope (Pyrotek, Inc.) can be used in place of asbestos rope for sealing the gap between the mold and bottom block in FDC casting operations. It prevents metal leakage and its good thermal stability allows it to be reused numerous times. It may also be used for sealing joints in pouring troughs.

Z-5 Treated Fiberglass Rope (Pyrotek, Inc.) can be used successfully as a crucible lid gasket on vacuum-type potroom tapping crucibles. It replaces the presently used Johns-Manville 872 or 702 asbestos gasketing material. However, Z-5 will not replace gaskets made of twisted aluminum foil. Plants using foil gaskets will in all probability have to continue that practice.

Fiberseal K-2 (Pyrotek, Inc.) has been used successfully by Massena as a replacement for the asbestos rope which was used to pack bottom blocks.

Another alternative is Thermo-Ceram Rope by Garlock.

Tubing Tape for
furnace seals
and general
insulation

Tape replacements include Pyrotex, Refrasil, Fiberfrax, and Nor-Fab.

ASBESTOS REPLACEMENT PROGRAM

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Material & Use

Thermocouple Wire

Replacement Status

Sleeves made of Refrasil or Fiberfrax material may be used in place of asbestos-coated wire in some cases. Tennessee has successfully used a fiberglass-coated, braided, and wrapped thermocouple wire from Thermoelectric Co., Saddlebrook, N.J. - P/N Q/Q/20-J (Standard Grade) in their ingot preheat and a two conductor 20 gauge premium grade thermocouple wire - Q/TW-20-JJ in their annealing furnace.

Warrick has found two thermocouple wire substitutes:

1. J type lead wire 6Al6 gauge by Thermoelectric.
2. K type 16 gauge wire made of fused teflon, polyvinyl and fiberglass by Claud S. Gordon Co.

A ceramic fiber product from 3M, Nextel 312, has been tried, but it has not held up during use.

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ASBESTOS - POTROOM USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Cradle to Pot Shell</u>	Quarry Tile	Wenatchee	Good replacement
<u>Insulation</u>	Curit Fiberglass Fill Board	Warrick	Seems OK
	Cerawool Fill Board	Warrick	Will test
	Cem-Fil GRC Sheet	Warrick	Didn't hold up
	Cem-Fil GRC	Massena	Not successful
	J-M Asbestos-Free Millboard	Massena	Installed on some pots and appears OK. Will be used on all future pot rebuilds.
			Mechanical Engineering Division, Pittsburgh, specifies Johns-Manville Cerawool Millboard as a substitute for JM-106 Millboard. Compressive strength and insulating quality are comparable. Cost for Cerawool Millboard is \$1.50 each for 1/4" x 3" x 48" pieces in lots of 250, or \$1.25 each in lots of 500. This is less than the \$5.00 per piece you are paying for Chem-Fil board.
<u>Superstructure Foot</u>	Cem-Fil GRC 9"x7"x1"	Badin	Product was not even and resulted in rocking of the superstructure.
<u>Insulation</u>	Marinite P - 1/2" sheet	Massena	To be tested
		Badin	Crushed
	R-680	Badin	Currently testing
			Mechanical Engineering Division, Pittsburgh, presently specifies ebony asbestos for this item. Tests on other materials have not been successful.

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ASBESTOS - POTROOM USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Pot Cover Insulation</u>	Almac Plastic Industries' High-Temp. Glass	Massena	To be tested
	Marinite P - 1/2" sheet	Massena	Not successful
	Pyrotek Fiberseal H-3 Fabric	Badin	Double the fabric; works well for repairs.
		Massena	Not successful
		Warrick	Works well; now standard; also works for sideshield insulation.
	Amatex-Thermoglass #G-36P752	Wenatchee	Satisfactory
		Badin	Will use in all new pot covers.

Mechanical Engineering Division, Pittsburgh,
has eliminated use of asbestos by wrapping
Amatex-Thermoglass #G-36P752 around an
aluminum bar. In other installations,
fiberglass fabrics have been used as the
insulating material.

ASBESTOS - POTROOM USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Walkway Grating</u>	Pyrotek E-40	Badin	Crumbled
<u>Insulation</u>	Pyrotek Phenolic Paper	Badin	Currently testing; easy to work with but expensive.
	Pyrotherm G-5 Insulating Board	Badin	To be tested
	Marinite P - 1" Board	Badin	Not satisfactory .
	Marinite P - 1/2" Board	Badin	Not satisfactory
		Massena	Not successful
	GRC Cem-Fil 1/4" & 3/8"	Massena	Not successful
	M-50 Pyrotherm Dense Board	Massena	Unsuccessful; it crumbles.
	Chem-Fil Fiberboard by Louisville Insulation	Warrick	Currently trying this cement-fiberglass product

Mechanical Engineering Division, Pittsburgh, specified Chem-Fil fiber reinforced cement for the new Badin and Noranda potlines. Previously specified Koppers NCX (fire-retardant) treated wood. The disadvantage of wood is that it still chars when exposed to molten bath. The cost of Chem-Fil and treated wood are comparable.

ASBESTOS - POTROOM USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Bus Insulation</u>	Marinite P - 1" sheet	Badin	Crumbles
	Marinite P - 1/2" sheet	Massena	Not successful
	Cem-Fil GRC 1/4" & 1/2"	Massena	Not successful
			Mechanical Engineering Division, Pittsburgh, eliminated use of transite by substituting an aluminum bar with a 1/16" layer of glass fabric epoxy, NEMA Grade G-11, taped to each side of the bar.
<u>Pot Exhaust Duct</u>	Pyrotek Pipe	Warrick	Looked good in preliminary testing; continuing testing with interior coatings to prevent corrosion.
	Hetron 197	Badin	Looks good on 9 pots; changing to this product.
		Wenatchee	Fiberglass pipe with antimony and dynel liners failed, and replaced by normal transite.
	Hetron 92	Wenatchee	Fiberglass pipe with antimony and asbestos linings - satisfactory.
	Fiberfrax Laminate Tubes by Carborundum, Inc.	ATC	Currently testing
			Mechanical Engineering Division, Pittsburgh, has conducted extensive tests on Hetron 197 at Wenatchee and Warrick. This material is quite expensive and may not be as durable as transite.

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ASBESTOS - POTROOM USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Exhaust Duct Gaskets</u>	Pyrotek Fiberseal Felt T-1	Massena	Not successful
	Pyrotek T-22 Fiberglass Cloth	Massena	Successful; replacing asbestos as pots are rebuilt. Mechanical Engineering Division, Pittsburgh, is specifying asbestos impregnated sheet material; however, Garlock's Gylon material would probably work for this application.
<u>Siphon Gaskets</u>	Pyrotek Fiberseal M-13 1/8" Compressible Board	Massena	Satisfactory
		Badin	Currently using this product.
	Fiberseal Felt G-1 - 1/2" & T-1 - 1/4"	Massena	Unsuccessful
		Badin	Tested and proved OK, but prefer Fiberseal M-13.
	J-M Asbestos-Free Millboard	Massena	Satisfactory, presently in use.
	J-M Ceraform Heat Seal	Rockdale	Not as stable as asbestos; needs to be replaced more often. Mechanical Engineering Division, Pittsburgh, presently specifying Pyrotek T-1 felt material for this application.

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ASBESTOS - POTROOM USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Ladle & Ladle Lid Seal</u>	Silicon Red Rubber Air Hose - 3/4"	Warrick	Standard usage (but different seal than other plants)
	Fiberseal Rope F-10, 1-1/2"	Massena	Unsuccessful
	Refrasil-wrapped around rubber hose	Badin	No good; rubber melts; seal breaks.
	1" Fiberseal Rope D-1	Anaconda	Uses 600 ft. per month of D-1
	Pyrotek Treated Z-5 Tape	Massena	Successful; presently in use. Mechanical Engineering Division, Pittsburgh, presently specifying Pyrotek Z-5 material. Several layers of this material are used for one seal.
<u>High Temperature Exposure Insulated Electrical Wire P-75, P-225 Potwiring, P-225 Jackmotors, Calrod heaters</u>	High Temperature Silicon Braid Copper Conductor, 1000 V., 200°C	Massena	Satisfactory. Limited replacement practice.

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ASBESTOS - CARBON BAKE USE SUBSTITUTES

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<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Exhaust Duct Manifold Gaskets</u>	Pyrotek Composition Boot V-5, M-6, H-3 Fabric	Massena	To be tested. Expect shipment October 1981.

ASBESTOS - WIRE, ROD AND BAR USE SUBSTITUTES

<u>Specific Application</u>	<u>Substitute</u>	<u>Location</u>	<u>Comments</u>
<u>Jarke Rack Liners</u>	Pyrotek 747 Cloth	Massena	Unsatisfactory; frays easily.
	Pyrotek F-1 Cloth	Massena	Unsatisfactory; frays easily.
	Pyrotek T-23 Tape	Massena	Unsatisfactory; frays easily.
	Pyrotek Glass and Kevlar Blend	Massena	Unsatisfactory; frays easily.
	Pyrotek T-22 Tape	Massena	Unsatisfactory; frays easily.
	Newtex Fabric Tape	Massena	Unsatisfactory; frays easily.
	Zetex 1200 Tape	Massena	Unsatisfactory; frays easily.
	Zetex 32500	Massena	Successful so far; encouraging.

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ASBESTOS REPLACEMENT MANUFACTURERS

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<u>Product</u>	<u>Supplier</u>	<u>Telephone No.</u>
<u>Pyrotex</u>	Newtex Industries, Inc. Railroad Avenue P. O. Box 25 Victor, New York 14564	716/924-9135
<u>Fiberseal Products</u>	Pyrotek, Inc. East 9601 Montgomery Avenue Spokane, WA 99206 -OR- Box 77 - R.D. #1 Claremont Road Carlisle, PA 17013 -OR- Santa Fe Springs, CA	509/926-6211 717/249-2075
<u>Refrasil</u>	HITCO Division of Armco Steel Middletown, Ohio 45042	
<u>Nor-Fab Yarns; Fabrics</u>	Amatex 1032 Stanbridge Street Norristown, PA 19404	215/277-6100
<u>Fiberfrax</u>	The Carborundum Company Insulation Division P. O. Box 808 Niagara Falls, NY 14302	716/278-6221
<u>Hi-Temp 270</u>	Penn Compression Moulding, Inc. Burton Street Pittsburgh, PA 15218	412/351-4004
<u>Ceramic Fiber Products</u>	Kaowool Babcock & Wilcox Cem-Fil Corporation Two International Plaza Drive Nashville, TN 37217 Keller Glove Mfg. Co. Plumsteadville, PA 18949	615/361-4664 215/766-8818
<u>Marinite and Other Products</u>	Johns-Manville The Manville Corporation Ken-Caryl Ranch Denver, CO 80217	303/978-2000

FROM MICHAEL J. VAUDREUIL

TO MEMORANDUM

PITTSBURGH OFFICE

1980 August 14

RE: ASBESTOS REPLACEMENT UPDATE

The following sections summarize the progress made over the past year in the search for asbestos substitute materials. The discussions are organized by asbestos product, and within each section by specific application. A supplemental list of substitute material suppliers is included.

1. Molten Metal Marinite

There is presently only one necessary use for asbestos in ingot plant operations; that is, header applications. There are adequate replacements in Johns-Manville's Marinite I and Pyrotek's Pyrotherm B-2 board products and R-680 for all other melting and casting needs. Therefore, Molten Metal Marinite need not, and should not be used for dams, basins, troughs, etc. However, at present, the suitability of substitute materials for use as floats is questionable.

Some header-related applications of asbestos have also been eliminated. After header design modifications, R-680 can be used for all FDC headers 635 mm (25 in.) and smaller. With this substitution, Lafayette, Vancouver and Massena should be asbestos free.

Molten Metal Marinite must still be used for HDC and tool and jig headers. R&D programs at ATC will continue to address these areas.

2. Asbestos Rope

Fiberseal A-1 rope (Pyrotek, Inc.) can be used in place of asbestos rope for sealing the gap between the mold and bottom block in FDC casting operations. It prevents metal leakage and its good thermal stability allows it to be reused numerous times. It may also be used for sealing joints in pouring troughs.

Z-5 treated fiberglass rope (Pyrotek, Inc.) can be used successfully as a crucible lid gasket on vacuum-type potroom tapping crucibles. It replaces the presently used Johns-Manville 872 or 702 asbestos gasketing material. However, Z-5 will not replace gaskets made of twisted aluminum foil. Plants using foil gaskets will in all probability have to continue that practice.

3. Transite

Transite, a structural, fire-retardant asbestos/portland cement board, is used extensively in construction. ATC has tested glass-reinforced cement (GRC) sheet as a replacement for transite.



MEMORANDUM

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Although GRC boards are not suitable for high temperatures ($>320^{\circ}\text{C}$) or molten metal contact, they can be used in fire resistant components, pipe work, furnace shells, etc. Physical properties are similar to transite except that GRC board has lower shear strength. However, proper engineering design can compensate for this deficiency.

4. Thermocouple Insulation

Finding a suitable replacement for asbestos-coated thermocouple wire has been particularly troublesome. Many substitutes have been rejected because of low abrasion resistance and/or friability at high temperatures.

A new ceramic fiber product from 3M, Nextel 312, purportedly exhibits excellent abrasion resistance and immunity to thermal shock. The attached brochure provides more complete product information. If physical properties of Nextel 312 are as claimed, it should prove to be a suitable substitute for asbestos coated wire.

Comments and additions to the information presented are encouraged.

FROM

MICHAEL J. VAUDREUIL

TO

PITTSBURGH OFFICE

INDUSTRIAL HYGIENE CONTACTS -
DOMESTIC & FOREIGN

1980 August 14

RE: ASBESTOS REPLACEMENT PROGRAM

As part of Alcoa's asbestos replacement program, a listing of applications and substitutes for asbestos was compiled and distributed in August of 1979. Since that time, some headway has been made in the development of substitutes for several uses of asbestos. The progress to date is reviewed in the attached memorandum.

An updated version of the original master listing is in preparation. Distribution of the revised registry is planned for 1980 November 01. However, critical to this effort is additional input from all Alcoa locations. Information on current plant asbestos use, as well as any successes (or failures) with substitute materials is requested. In order to meet the November 01 target date for release of the updated list, replies should be received by 1980 October 01. This ongoing exchange of information is necessary for the continued success of the program.

With the assignment of Haig Sakoian as Senior Industrial Hygienist, Tennessee Operations, I have assumed the responsibility for overall coordination of the asbestos replacement program. Therefore, please direct all future correspondence to my attention.

Michael J. Vaudreuil

MICHAEL J. VAUDREUIL

MJV:mlf

Distribution:

Location Managers - Domestic & Caribbean
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ALCOA

INDUSTRIAL HYGIENE CONTACTS -
DOMESTIC & FOREIGN
1980 August 14
Page 2

Distribution (con't):

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R. L. Graves - Pgh.
M. J. Caprio - Pgh.
J. M. McCollum - Pgh.
D. St. Jacques - ATC

cc: T. B. Bonney, Pittsburgh Office - 7
E. E. Rumberger, Pittsburgh Office - 7
V. L. Hammersmith, ATC-B
V. W. Rieke, Pittsburgh Office - 2
R. M. James, Pittsburgh Office - 7
R. W. Flanagan, Pittsburgh Office - 6
C. Dixon, Pittsburgh Office - 6
P. H. Scott, Pittsburgh Office - 6
B. L. Sicheloff, Pittsburgh Office - 6

Attachments

SUPPLEMENTAL SUPPLIER LIST

<u>Product</u>	<u>Available Forms</u>	<u>Supplier</u>	<u>Phone No.</u>
Nextel 312 TM (ceramic fiber)	1. woven fabric and tape 2. braided sleeving 3. bulk fiber	Ceramic Fiber Products/3M 219-1 3M Center St. Paul, MN 55101	612/733-1558
Zetex TM (a.k.a. Pyrotex TM)	1. woven fabric	Newtex Industries Railroad Avenue P. O. Box 25 Victor, NY 14564	716/924-9135
Thermoglass TM (fiberglass)	1. twisted rope 2. braided sleeving 3. woven fabric and tape	Amatex Corp. 1032 Stanbridge St. Norristown, PA 19404	215/277-6100
HI Fibe ^R (coated polyethylene fibers)	1. fiber fillers for cement, caulkings, etc.	Hill Bros. Chemical Co. One City Boulevard Suite 1521 Orange, CA 92668	714/634-3322
Celiox Fibers (polyacrylonitrile)	1. fabrics *2. conversion to pure carbon fibers	Celanese Plastics & Specialities Co. 26 Main Street Chatham, NY 07928	201/635-2600
*heat treatment			
CER-WOOL (ceramic fiber)	1. blankets 2. vacuum-formed boards 3. bulk fiber	C. E. Refractories P. O. Box 828 Valley Forge, PA 19482	412/351-4409
Siltemp (fibrous glass)	1. cloth	Haveg Industries, Inc. 900 Greenback Road Wilmington, DE 19808	1-800-441-7777
GRC Sheet (fiberglass reinforced cement)	1. flat and corrugated board	GRC Products, Inc. 17051 I.H. 35N Schertz, TX 78154	512/651-6773
GRC Sheet (fiberglass reinforced cement)	1. flat and corrugated board	CEM-FIL Corporation 120 Spence Lane Nashville, TN 37210	615/883-7563
Preox TM (polyacrylonitrile fiber)	1. woven fabric	Gentex Corporation Carbondale, PA 18407	717/282-3550
Kelvar TM and Nomex TM (aramid fiber)	1. cloth 2. rope 3. pump packings 4. tapes and webbings 5. braided sleeving	E.I. duPont de Nemours & Co. Textile Fibers Department Wilmington, DE 19898	302/999-4693

Nextel® 312

3M

Ceramic Fiber Products

Product Bulletin

Thermocouple Insulation

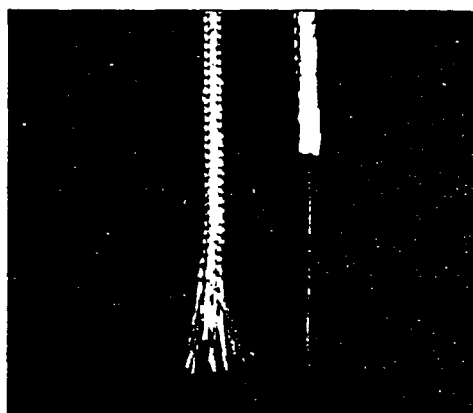
At last: a practical high-temperature insulating material that eliminates the two biggest causes of thermocouple failure.

Dimensional stability and abrasion resistance have always been big sources of trouble for high-temperature insulators. The most commonly used fibers—those made from vitreous silica—typically shrink, abrade, fray, or crumble to the point where wires become exposed. This obviously creates a potential for inaccurate temperature readings. The traditional alternative, ceramic beads, solves the problem of excessive shrinkage and abrasion, but only at a high cost for labor.

Now there's a better alternative: Nextel® 312 Ceramic Fiber from 3M. Nextel 312 withstands operating temperatures of 1000° F. to 2600° F. continuously. It shrinks less and resists the combined effects of abrasion, flexing, and high temperatures better than asbestos, quartz, and vitreous silica fibers. It also offers good chemical resistance and immunity to thermal shock.

Proven dimensional stability.

A recent test compared the dimensional stability of Nextel 312 and vitreous silica by heating sleeves braided around separate lengths of wire for ½ hour at 2000° F. When the samples were removed from the furnace, Nextel 312 still covered the wire completely, thanks to shrinkage of less than 1 per cent. The vitreous silica fiber had shrunk by roughly 12 per cent, leaving an inch of wire exposed at one end.



Nextel 312 braided around a thermocouple wire and heated at 2000° F. for ½ hour shrank 1%. Vitreous silica handled the same way shrank 12%.

Exceptional resistance to abrasion.

In another test, a Duplan "silk-testing machine" was used to compare filaments of Nextel 312 and vitreous silica. Blades were rubbed back and forth on the two products after they had been heated for ½ hour at 1000° F., 1500° F., and 2000° F. Results showed that Nextel 312 lasted 2½ to 5 times as long as the vitreous silica fiber. This means that at 1000° F., Nextel 312

performed 400 per cent better. The figures for 1500° F. and 2000° F. were 300 per cent and 166 per cent respectively.

No residual acids or chlorides to cause etching of wires.

Because Nextel 312 Ceramic Fibers contain no residual acids or chlorides, there's no chemical present to corrode or etch the wires. Even in a test involving exposure to 96 per cent relative humidity, no noticeable electrolytic corrosion was detected. The test consisted of putting Nextel 312 fibers in contact with two unconnected bare #32 copper wires. A 250-volt D.C. potential was applied across the wires. After 20 hours, corrosion was determined by calculating the ratio of anode wire tensile strength to cathode wire tensile strength. Three test runs produced ratios above 0.99; since the maximum ratio possible was 1.00, there was essentially no electrolytic corrosion.

Available from your local thermocouple supplier.

Nextel 312 is being manufactured in production quantities right now. For more information on how it can increase the service life of your thermocouples, contact your supplier. Or call 3M at 612-733-1558 (in Northeast locations call 201-575-2076) or write 3M at the address below.

FROM: GERALD D. HICKS - 30

TO: *A.W. Flanagan - Pgh. H+D*
~~MEMORANDUM~~

1981 August 14

RECEIVED

AUG 20 1981

RE: ASBESTOS REPLACEMENT PROGRAM

INDUSTRIAL HYGIENE

As part of Alcoa's continuing program to reduce and ultimately eliminate all uses of asbestos in plant operations, it is necessary to conduct a rather detailed survey of asbestos uses still in effect at Massena. For such a survey to be of real value, we not only need to know where asbestos materials are still in use, but more importantly, what replacement materials have been tried and whether they are successful or not and why, if not.

Our need to know where asbestos materials are still in use is to provide the industrial hygiene section with information to enable us to air sample all involved employees to document their levels of exposure. By OSHA regulation we are required to sample all such personnel each six months to confirm LOW or NO exposures. This report is also used to determine those personnel requiring a medical examination.

From a health hazard and governmental regulation standpoint, the asbestos problem has not diminished in the least. Implications are that asbestos control regulations will become even more stringent in the future. Because the continued use of asbestos products may result in unnecessary health hazards and concerns to our employees, as well as additional costs to Alcoa to comply with specific provisions of the OSHA standard, it is believed to be in Alcoa's best interests to continue eliminating the use of asbestos products wherever possible. A systematic effort should be made to discontinue uses, when feasible and practical, by substitution or elimination.

I have attached copies of an Asbestos Replacement Program Questionnaire that I would appreciate each department to complete and return to me. Please use a separate questionnaire sheet for (1) each type of asbestos material and (2) each use made of the material. Please include a sheet for successful replacements. If asbestos materials are not used in your area, please note it on a form and return it to me. I will appreciate it if your response to the questionnaire is completed by 1981 August 31.

On the line for Materials please list the following:

Cloth
Paper
Marinite
Packing
Rope

Sheet Gasketing
Tape
Thermocouple Wire
Personal Protection

On the line for Use please list such applications as:

Insulation, Heat
Insulation, Electrical
Welding Blankets and/or
Protection
Coil Tray liners
Heat breaks
Molten Metal Casting
Pump Packing (uncoated,
noncompressed, braided
asbestos)

Cradle to Pot Shell Insulation
Superstructure Fort Insulation
Pot Cover insulation
Walkway grating insulation
Bus insulation
Exhaust duct gaskets
Siphon gaskets
Ladle and Ladle Lid Seal

Also list the Job Classification Exposed whenever the asbestos material is fabricated, applied, used in process or removed from service.

By creating this listing and providing feedback to all people concerned we can hope to remove or eliminate our dependence on asbestos materials.

Also attached to this letter is a list of asbestos replacement materials, their suppliers and telephone numbers.

Gerald D. Hicks

GERALD D. HICKS

GDH:jmm

Attachments

cc: (w/attachments)

R. A. G. Vines - For information only
G. H. Schneider - 303 - For information only
G. L. McCullough - 28 - For information only
R. H. Field - 8 - For information only
J. R. Feeley - 59A - For information only
Dr. M. J. Elder - 22 - For information only
E. T. Klenske - 4 - For information only
R. N. Peterson - 7 - For information only
D. E. Jackson - 301 - For information only
W. R. Duso/T. A. Reine - 25 - For information only
J. D. Latvaitis/M. W. Clarke - 301
K. P. Bellor - 301
W. T. Burt - 201
W. B. Parker - 204
W. H. Jochmann 60

Distribution continued on next page

cc: (continued)

R. J. Sharpsten - 207
W. J. Curtin - 59
D. E. Campbell - 44
J. V. Carroll - 59
F. R. Gero - 31
H. P. Besio - 73
J. L. MacIntosh - 210
M. W. Wall - 60
C. W. Houlihan - 45
D. G. Martin - 60
R. J. Kopecky - 32A
G. M. O'Brien - 30
R. J. Dougherty - 30
R. W. Flanagan - Pgh. H & S
P. H. Scott - Pgh. H & S
file

ASBESTOS REPLACEMENT MANUFACTURERS

<u>Product</u>	<u>Available Forms</u>	<u>Supplier</u>	<u>Phone No.</u>
Nextel 312 TM (ceramic fiber)	1. woven fabric and tape 2. braided sleeving 3. bulk fiber	Ceramic Fiber Products/3M 219-1 3M Center St. Paul, MN 55101	612/733-1558
Zetex TM (a.k.a. Pyrotex TM)	1. woven fabric	Newtex Industries Railroad Avenue P. O. Box 25 Victor, NY 14564	716/924-9135
Thermoglass TM (fiberglass)	1. twisted rope 2. braided sleeving 3. woven fabric and tape	Amatex Corp. 1032 Stanbridge St. Norristown, PA 19404	215/277-6100
HI Fibe ^R (coated polyethylene fibers)	1. fiber fillers for cement, caulkings, etc.	Hill Bros. Chemical Co. One City Boulevard Suite 1521 Orange, CA 92668	714/634-3322
Celiox Fibers (polyacrylonitrile)	1. fabrics *2. conversion to pure carbon fibers	Celanese Plastics & Specialities Co. 26 Main Street Chatham, NY 07928	201/635-2600
*heat treatment			
CER-WOOL (ceramic fiber)	1. blankets 2. vacuum-formed boards 3. bulk fiber	C. E. Refractories P. O. Box 828 Valley Forge, PA 19482	412/351-4409
Siltemp (fibrous glass)	1. cloth	Haveg Industries, Inc. 900 Greenback Road Wilmington, DE 19808	1-800-441-7777
GRC Sheet (fiberglass reinforced cement)	1. flat and corrugated board	GRC Products, Inc. 17051 I.H. 35N Schertz, TX 78154	512/651-6773
GRC Sheet (fiberglass reinforced cement)	1. flat and corrugated board	CEM-FIL Corporation 120 Spence Lane Nashville, TN 37210	615/883-7563
Preox TM (polyacrylonitrile fiber)	1. woven fabric	Gentex Corporation Carbondale, PA 18407	717/282-3550
Kelvar TM and Nomex TM (aramid fiber)	1. cloth 2. rope 3. pump packings 4. tapes and webbings 5. braided sleeving	E.I. duPont de Nemours & Co. Textile Fibers Department Wilmington, DE 19898	302/999-4693

<u>Product</u>	<u>Available Forms</u>	<u>Supplier</u>	<u>Phone No.</u>
<u>Pyrotex</u> TM		Newtex Industries, Inc. Railroad Avenue P. O. Box 25 Victor, NY 14564	716/924-9135
<u>Fiberseal Products</u>		Pyrotek Incorporated East 9601 Montgomery Ave. Spokane, WA 99206 -or- Box 77 - R. D. #1 Claremont Road Carlisle, PA 17013 -or- Santa Fe Springs, CA	509/926-6211 717/249-2075
<u>Refrasil</u>	1. Cloth, tape and sleeving 2. Bulk fiber 3. Cordage & yarn	HITCO Division of Armco Steel Middletown, OH 45042 -or- Chamberlain Rubber Co. 1712 Erie Blvd. East Syracuse, NY 13210	315/478-0935
<u>Nor-Fab Yarns: Fabrics</u>		Amatex 1032 Stanbridge St. Norristown, PA 19404	215/277-6100
<u>Fiberfrax</u>	1. Bulk Fiber 2. Blankets 3. Cloth, tape and sleeving 4. Paper 5. Coating Cements 6. Boards 7. Tamping Mix 8. LDS Moldable 9. Vacuum Cast 10. Fiberwall	The Carborundum Company Insulation Division P. O. Box 808 Niagara Falls, NY 14302	716/278-6221
<u>Hi-Temp 270</u>		Penn Compression Moulding, Inc. Burton Street Pittsburgh, PA 15218	412/351-4004
<u>Ceramic Fiber Products</u>	1. Bulk Fiber 2. Blanket 3. Strip 4. Vacuum formed shapes 5. Paper 6. Rollboard 7. Board 8. Wet Felt 9. Surface Coatings	The Babcock & Wilcox Co. Refractories Division 3623 Eggert Road Buffalo, NY 14127 -or- Refractory Products Co. P. O. Box 309 12 W. Main St. Carpentersville, IL 60110	716/662-9751
<u>Kaowool</u>			

<u>Product</u>	<u>Available Forms</u>	<u>Supplier</u>	<u>Phone No.</u>
<u>Ceramic Fiber Products</u>		Cem-Fil Corporation Two International Plaza Dr. Nashville, TN 37217	615/361-4664
		Keller Glove Mfg. Co. Plumsteadville, PA 18949	215/766-8818

ASBESTOS REPLACEMENT PROGRAM SURVEY

Department _____ Date _____

Material: _____

Use: _____

Job Classification Exposed: _____

Replacement Tested: _____ Date _____

Successful _____

Not successful _____

Comment: _____

Replacement Tested: _____ Date _____

Successful _____

Not successful _____

Comment _____

Replacement Tested: _____ Date _____

Successful _____

Not successful _____

Comment _____

Replacement Tested: _____ Date _____

Successful _____

Not successful _____

Comment _____

Questionnaire Completed by: _____ Phone: _____

W. B. GARYOTIS
CONSTRUCTION DEPARTMENT
PITTSBURGH OFFICE - 2 AB

① E. E. Rumberger - 4
T. I. STEPHENSON
PITTSBURGH OFFICE - 21 AB

Handwritten:
Terry
Should have
known
11/5/82

Handwritten:
Terry -
Walter's letter seems to confirm there
is good awareness in construction
re asbestos. I'm satisfied with that.
1982 JULY 16
Thanks for your interest! Rumberger

RE: ASBESTOS IN CONSTRUCTION MATERIALS

Mr. E. E. Rumberger, in his letter dated 1982 July 06, expressed some concern for the lack of construction participation in Alcoa's policy and objective to eliminate asbestos use in construction materials.

You can be sure that, since 1969, construction managers and safety engineers have been informed of asbestos health hazards and the preferred use of substitutes in paints or insulation or in roof felt materials.

Before asbestos substitutes were readily available on the Anaconda I Project in 1969, asbestos handling and dust control was given priority consideration. The fabrication of asbestos potlining materials was assigned to an isolated, enclosed area. Shop electric band saw cutting tables were equipped with dust collectors at the point of operation. Asbestos dust was collected in plastic bags and disposed of in designated hazardous waste sites. Workers in the fabricating shop were supplied with appropriate respirators.

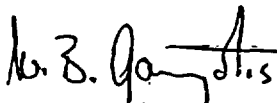
In 1974, on the Northwest Alloys Project, asbestos dust control methods for the installation of ferro-silicon furnace gaskets required the Norwegian manufacturer to supply gaskets cut to size, pre-drilled, coated, and packaged in lots of five in plastic bags for safe handling at the point of installation.

In the summer of 1980 at the Warrick location, Building 260, electrostatic precipitator rebuild, the sheeting and insulation material was removed wet. The insulation material was broken into small pieces, bagged, and removed to a designated hazardous waste area. Workers were supplied with paper suits, gloves and applicable respirators.

T. I. STEPHENSON
PAGE 2
1982 JULY 16

Field construction managers avoid the installation of materials containing asbestos. Occasionally the monitoring system fails, and asbestos can be found on a site. However, its use is stopped and a substitute is sought. At Point Comfort in May, 1981, the installation of felt paper pipe covering (containing asbestos) for washer tanks was stopped and delayed until the contractor found a suitable substitute.

In addition to the above type of action, Alcoa Standards and Site Specifications play a leading role in controlling the use of hazardous materials at the site. Mr. Alkire is making the necessary standards changes when suitable substitutes are available.


W. B. Garyotis

WBG:ef

cc: T. M. Brown/R. G. Duhon - 2 AB

F I L E

E. E. RUMBERGER
PITTSBURGH OFFICE - 6

MR. J. W. DeWALT
PITTSBURGH OFFICE - 2

MR. T. M. BROWN
PITTSBURGH OFFICE - 2

1982 July 06

RE: ASBESTOS IN CONSTRUCTION MATERIALS

Alcoa has had a policy and objective for the last several years to eliminate asbestos and asbestos-containing materials insofar as possible and practical considering the health hazard they represent to employees. This effort has been conducted primarily through Production, Engineering, Procurement, Research, Safety, and Industrial Hygiene personnel at both the plant and Corporate levels. The focus has been mainly on production and process uses. It would seem that we have been remiss in not being sure that Construction people also recognize this objective and participate as appropriate.

We recently had occasion to learn of Warrick using a masonry paint that is approved under Engineering Standard 33.1.4 which contains 14% asbestos. We have now asked Tim Alkire to work with Procurement to determine what other coatings we have in our approved list which possibly contain non-essential asbestos as a filler instead of a safer non-cellulose type filler which is now available in many paints. So-called "encapsulated" fibers are suggested to be safe; and, while this might reduce fiber dissemination in air during application, it does not assure what happens during demolition or destruction of structures. We suspect there might be considerable generation of asbestos at that time from asbestos-containing paints. In any event, we believe it prudent to find safer substitutes wherever possible.

The purpose of this letter is to ask that the Construction Department be cognizant of Alcoa's objective to be asbestos-free in our plants insofar as possible and practical. I would appreciate your communicating this accordingly.

Many thanks.

E. E. RUMBERGER

EER/eds

cc: T. I. Stephenson - Pgh. 2

ALCOA

- package to DR Balya 1962 Aug 10

DE: R. D. SCHULTZ
São Paulo Office

PARA: Mr. ROBERT SHARKEY
Pittsburgh Office - Room 628 C - A

Re: FIBRE-CEMENT ROOFING AND SIDING

We are attaching with this letter two samples of the fibre-cement material we propose to use for special roofing and siding for this project.

As we discussed during our 3-way conversation with T.I. Alkire these samples are for testing to see if the material is acceptable for use.

Mr. Alkire's wire indicates that we are not to order Building 035 siding until the material receives Pittsburgh approval. We await your comments so that an acceptable material may be immediately ordered.

Note that the corrugated section is the material proposed for the roofing and siding for Building 035. The other section is similar to the roofing of most of the substations and control rooms in the Port, Refinery and Smelter areas.


R. D. SCHULTZ

SB DeWall - São Paulo
c.c.: G.L. Anderson/D.W. Barnes - São Paulo
A. Pasalo
J.L. McKinstry - São Paulo
T.I. Alkire - Pgh.

JB Ferrag - São Paulo

RDS/rbv.



ALCOA

L. F. DIBLE
PITTSBURGH OFFICE 28

TO

DR. W. G. TRUCKNER
ALCOA LABORATORIES

MR. T. D. RANDALL
ROCKDALE WORKS

H & S
Industrial Hygiene

RECEIVED

SEP 24 1981

INDUSTRIAL HYGIENE

1981 JULY 10

BDD
EER
TBB
RMJ
BLS
PHS
MJV

JUL 13 1981

MLF
RWF
CD
DB
LMN
EDS

RE: MARINITE MACHINING INHALATION PROTECTION
Alconor, Igarassu, Brazil

→ We observed these operations and judged the concern and precautions to be inadequate. We mentioned this to Mr. Pitts and on 1981 July 01, I reported our observations to Mr. Alain Belda and Mr. Scorsone. I have also reported to Mr. Boak and he in turn has had a discussion with Mr. Rumberger.

I told Mr. Rumberger that ATC had selected some non-asbestos material for caster tips (Marinite C) and suggested that he check with you and Virginia Hammersmith. I believe you should stand ready to give whatever technical assistance may be needed. We had some prior involvement with Igarassu on tip material, but they advised us that they had gotten some help from Scal and believed their material was superior to the USA material.

→ Mr. Rumberger will pursue this matter with Alconor, and recommend remedial action.

→ I am requesting that Mr. Rumberger also treat a commercial situation. Our corrugated sheet gets strong competition from corrugated cast asbestos cement. The asbestos cement product is cheaper and dominates the market.

I told Messrs. Belda and Scorsone that the asbestos awareness in Brazil was shocking to me compared to the control and elimination activities here. He and Mr. Scorsone are somewhat bewildered by it too. In this connection, Mr. Belda would like whatever information you can put together on asbestos bearing products. He has two objectives: make sure Alcoa Aluminio is doing the right things, and do whatever outside missionary work that seems appropriate on the hazards of asbestos products - products like cast asbestos cement, corrugated sheet.

L. F. DIBLE

LFD:db

cc

E. E. Rumberger - 6

T. I. S. Boak - 14

S. D. Pitts - Igarassu, Brazil

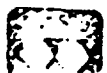
Alain Belda, V. R. Scorsone - Sao Paulo

E. M. Kasody - 28

G. B. Scott/E. B. Perry - 23

A. J. Sartschev - 3 WPH

Virginia L. Hammersmith - ATC



ALCOA