FROM E. E. RUMBERGER
PITTSBURGH OFFICE

TO E. E. RUMBERGER
PITTSBURGH OFFICE - 6

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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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

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Attachment

ASBESTOS REPLACEMENT PROGRAM

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ASBESTOS REPLACEMENT PROGRAM

GENERAL APPLICATIONS

Material & Use	Replacement Status
Belting for Drip Casting	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"

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Material & Use	Replacement Status
Cloth and Paper for Insulation and Welding Protection	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.)

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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.

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Material & Use	Replacement Status
Rope for packing and sealing	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.

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Material & Use	Replacement Status
Thermocouple Wire	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 6A16 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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Specific Application	Substitute	Location	Comments
Cradle to Pot Shell Insulation	Quarry Tile	Wenatchee	Good replacement
	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.
Superstructure Foot Insulation	Cem-Fil GRC 9"x7"x1"	Badin	Product was not even and resulted in rocking of the superstructure.
	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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Specific Application	Substitute	Location	Comments
Pot Cover Insulation	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.

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ASBESTOS - POTROOM USE SUBSTITUTES

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Specific Application	Substitute	Location	Comments
Walkway Grating Insulation	Pyrotek E-40	Badin	Crumbled
	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.

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ASBESTOS - POTROOM USE SUBSTITUTES

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Specific Application	Substitute	Location	Comments
Bus Insulation	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.
Pot Exhaust Duct	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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Specific Application	Substitute	Location	Comments
Exhaust Duct Gaskets	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.
Siphon Gaskets	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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Specific Application	Substitute	Location	Comments
Ladle & Ladle Lid Seal	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.
High Temperature Exposure Insulated Electrical Wire P-75, P-225 Potwiring, P-225 Jackmotors, Calrod heaters	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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Specific Application	Substitute	Location	Comments
Exhaust Duct Manifold Gaskets	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

Specific Application	Substitute	Location	Comments
Jarke Rack Liners	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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Product	Supplier	Telephone No.
Pyrotex	Newtex Industries, Inc. Railroad Avenue P. O. Box 25 Victor, New York 14564	716/924-9135
Fiberseal Products	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
Refrasil	HITCO Division of Armco Steel Middletown, Ohio 45042	
Nor-Fab Yarns; Fabrics	Amatex 1032 Stanbridge Street Norristown, PA 19404	215/277-6100
Fiberfrax	The Carborundum Company Insulation Division P. O. Box 808 Niagara Falls, NY 14302	716/278-6221
Hi-Temp 270	Penn Compression Moulding, Inc. Burton Street Pittsburgh, PA 15218	412/351-4004
Ceramic Fiber Products	Kaowool Babcock & Wilcox	
	Cem-Fil Corporation Two International Plaza Drive Nashville, TN 37217	615/361-4664
	Keller Glove Mfg. Co. Plumsteadville, PA 18949	215/766-8818
Marinite and Other Products	Johns-Manville The Manville Corporation Ken-Caryl Ranch Denver, CO 80217	303/978-2000

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