

FROM E. E. RUMBERGER
PITTSBURGH OFFICE

TO

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

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Attachment

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ASBESTOS REPLACEMENT PROGRAM

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ASBESTOS REPLACEMENT PROGRAM

GENERAL APPLICATIONS

Replacement Status

Fiberseal Fabric was tested and found to be inadequate.

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.

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

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"

Material & Use

Belting for Drip Casting

Block or Brick for furnaces

Brake Linings

Cement Patch for Boiler Maintenance

ASBESTOS REPLACEMENT PROGRAM

(Page 2)

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.)

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ASBESTOS REPLACEMENT PROGRAM

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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.

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 Carlock.

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 ebonite 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.

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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>Walkway Grating</u> <u>Insulation</u>	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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<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, Carlock'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>	Pyrrotek 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>	Pyrrotek 747 Cloth	Massena	Unsatisfactory; frays easily.
	Pyrrotek F-1 Cloth	Massena	Unsatisfactory; frays easily.
	Pyrrotek T-23 Tape	Massena	Unsatisfactory; frays easily.
	Pyrrotek Glass and Kevlar Blend	Massena	Unsatisfactory; frays easily.
	Pyrrotek 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

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

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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.



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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

MICHAEL J. VAUDREUIL:mjf
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Nextel[®] 312

3M

Ceramic Fiber Products

Product Bulletin

Thermocouple Insulation

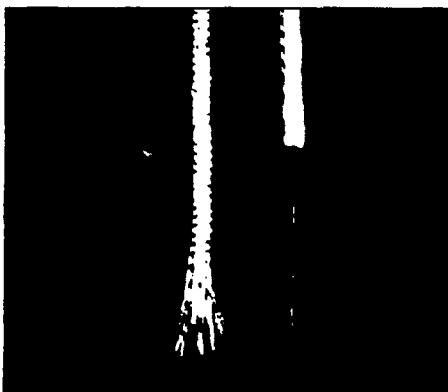
At last: a practical high-temperature insulating material that eliminates the two biggest causes of thermocouple failure.

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.

N-MBT1-3(119,5)11

LITHO IN U.S.A.

Ceramic Fiber Products/3M
219-1 3M Center
St. Paul, Minnesota 55101

ALCOA0000008557

3M

PITTSBURGH PURCHASING
INDUSTRIAL & PACKAGING
MATERIALS - 19

MR. JORGE CORNEJO WELLER
VERACRUZ, MEXICO

07JUN76

RE: ALTERNATES FOR ASBESTOS AND ASBESTOS - CONTAINING MATERIALS

This is in reference to your letter of 27APR76 on the referenced subject.

The asbestos block used in lining domestic pots is Johns-Manville's asbestos free Superex. This material is rated at 2000° F and has much less shrinkage at temperatures above 1500° F than the insulation boards containing mineral fibers.

As of this date, there is no substitute for Molten Metal Marinite for use in molten aluminum operations. There is a very active program in progress at the Alcoa Laboratories on an asbestos free material which shows much promise in replacing Marinite in ingot casting operations. Plant trials on this material have been underway for the past six months.

With respect to replacing asbestos paper and rope, the only possible candidates are in the ceramic-fiber class such as Carborundum's Fiberfrax or fiberglass materials. Have you pursued these applications with your present supplier of mineral wool block?

M. J. CAPRIO

MJC:gih

cc: R.P. Carter - 7 AB



ALCOA000000958



April 27, 1976

Mr. Robert P. Carter
Aluminum Company of America
Health & Environment Department
1501 Alcoa Bldg.
Pittsburgh, Pa. 15219. U.S.A.

RE: Alternates for Asbestos and Asbestos-Containing Materials.

Gentlemen:

As your letter dated Mar. 30, 1976, there are a few asbestos containing materials in use in our Plant.

For lining Pots we require 1", 2", and 3" H-temp asbestos blocks which we had been importing from USA, but due to problems to obtain from government the necessary import permits, we were forced to research our local market and fortunately we found a substitute made out of a mineral fiber instead of asbestos. This material has been in use for several years and we find it suitable for our requirements.

Other materials covered under these subject are the following:

- 1.- Molten metal marinite
- 2.- 1/32" x 36" wide asbestos paper used on our DC Casting Filters.
- 3.- JM-C-790 Packing Rope Braided asbestos, wire inserted, used for furnace doors and crucible covers.

Yours very truly,

JORGE CORNELIO WELLER
Purchasing Agent

Caprio's answer 1/27/76

Cc.- Mr. M.J. Caprio - Pur. Department - Pgh. 19AB.

eml.

ALCOA0000009582

ROBERT P. CARTER
HEALTH & ENVIRONMENT DEPARTMENT
PITTSBURGH OFFICE, 7AB

N. A. WILLIAM
REA MAGNET WIRE COMPANY, INC.
FORT WAYNE, INDIANA

03Jun76

RE: ASBESTOS USAGE AND REQUEST FOR SUBSTITUTIONS
Rea - Pontiac Street Plant

Ref. 1) D. Dewart letter 13Apr76 to N. William re:
"Asbestos Usage at Pontiac Street"

Ref. 2) N. A. William letter 29Apr76 to Robert P. Carter

This letter will serve to confirm our telephone conversation of earlier this week. Following the listing used in reference 1, I will comment on the specific items listed by Mr. Dewart.

Item (a) Exhibit A and Exhibit A-1

With respect to the various items of asbestos packing cloth and rope shown in these stock cards, I do not believe that we can provide you with a hard and fast rule to be applied. If in the use, including removal and replacement of any of these materials, it is likely that a worker can have even an infrequent exposure to a visible amount of airborne fiber or repeated exposures to low levels of airborne fiber, such a worker would be subject to the medical surveillance, monitoring and training requirements of the asbestos standard. These requirements are sufficiently burdensome that it would be desirable to find non-asbestos replacements for any such applications.

Item (b) Transite pipe and sheet.

It is probable that in the installation of this type of material, it will be sawed, drilled, and cut, resulting in generation of airborne fiber. In addition, when this material is subsequently removed in the course of maintenance or demolition, it is almost impossible to prevent the generation of airborne fiber. Therefore, these applications constitute logical ones for the use of non-asbestos containing alternates. If Mr. Dewart would supply to Mr. M. J. Caprio information regarding the service requirements for these products, it will enable him to recommend or seek to develop sources of non-asbestos containing alternates.



ALCOA0000009583

Item (c) Kaylo and Kaylo 20 pipe insulation and block insulation.

If, in response to Mr. Dewart's April 12, 1976 letter to the vendor, you learn that this product does still contain asbestos fiber, our recommended approach would be the same as for Item (b).

Item (d) Johns-Manville Superex Block Insulation

Johns-Manville has had available now for several years their Superex AF grade material which is as asbestos-free alternate to the original Superex product. We would recommend immediate conversion to this product because of the strong likelihood of airborne fiber exposures both in installation and removal of this type of material.



Item (e) Johns-Manville Marinite 36 Insulating Board

This item falls in the same category as Item (b) above. If Mr. Dewart will furnish to Mr. Caprio the service requirements for the applications involved, he will assist you in locating satisfactory non-asbestos alternates.



Item (f) Eagle-Pitcher Super 66 Insulating Cement

Since the vendor's letter of April 19, 1976 indicates that this product is asbestos-free, its use should not present any special problems as long as good nuisance dust control is exercised.

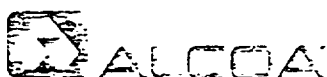


I'm sorry for the delay in replying to your letter, but hope that this information will be helpful.

ROBERT P. CARTER

RPC:lmn

cc: M. J. Caprio, Pittsburgh 19AB (with copy N. William letter 29Apr76, D. Dewart's letter 13Apr76 & Exhibit A, A1, Dewart's letters 12Apr76 to Owens-Corning and Eagle-Picher, Birmingham's letter 19Apr76)



ALCOA0000009584

T2 S/L1

INTERNAL CORRESPONDENCE

FROM N. A. William
Rea Magnet Wire Co., Inc.
Fort Wayne, IN

To Robert P. Carter
Alcoa-Pittsburgh
732B

Subject: Asbestos Usage & Request for Substitutions
Rea-Pontiac Street Plant

Date April 29, 1976

Mr. D. Dewart, Plant Engineer, has requested assistance in locating substitutions for asbestos. I am enclosing a copy of his memo to me. Your comments and help will be welcome.

N. William

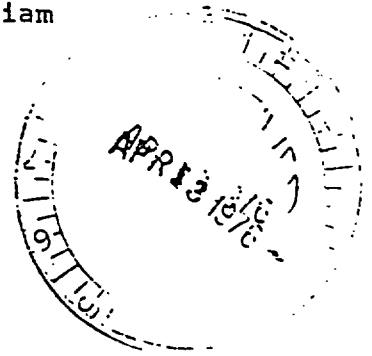
ra
Encl.

INTERNAL CORRESPONDENCE

FROM D. Dewart

To N. William

Date April 13, 1976



RE: ASBESTOS USAGE AT PONTIAC STREET

Reference is made to the concern about asbestos products and specifically to the Carter/Caprio memo of 3-30-76 to you.

Poundwise/or quantity-wise, as a general statement, we use only a relatively small amount of asbestos bearing items and an employee works with such items only infrequently. But since asbestos has unique insulation and high temperature characteristics, asbestos bearing compositions are employed in a number of specific uses throughout the plant.

We have attempted a general listing of the products used, with comments where appropriate. It is difficult to attach definite parameters for substitutes -- it is much easier to state "... or equivalent." Seriously, it is hoped that the onus can be placed on the makers of substitute materials to advise whether their product can substitute (or closely substitute) for the asbestos-bearing product. Many of our temperatures are in the 700°F. to 1500°F. range and possibly don't really require all that asbestos can protect against.

I am confident substitution can be readily made in some cases and as regarding our annealer sleeves listed below, we already have made substitutions. I think we need help and advice on the use of asbestos gasketing, asbestos rope, etc. where the exposure seems so slight and acceptable substitutes may be hard to come by.

Our Known List Follows:

- (a) Exhibit A and Exhibit A-1 - listings from our storeroom of various asbestos products used relatively infrequently as a rule. Many of these items are supplied by our local vendor, Wayne Pipe and Supply, and many are manufactured by Raybestos-Manhattan.
- (b) Transite pipe and sheet. This is a trade name of a cement-asbestos product by Johns-Manville.

ALCOA0000009586

- (c) Kaylo and Kaylo 20 pipe insulation and block insulation. This is used to line various pipes and equipment against heat loss. (One use of Kaylo 20 is the sleeves for our fine enamel annealers. However, we will now substitute A.P. Green's Mineral Wool Block Insulation -- 1900°F. for it.) Kaylo is a rigid hydrous calcium silicate insulation reinforced with asbestos fibers.
- (d) Johns-Manville Superex Block Insulation (temperature to 2000°F.).
- (e) Johns-Manville Marinite 36 Insulating Board. (This is used to line inside of small ovens, etc.).
- (f) We use a rather large amount of Eagle-Picher's "Super 66" Insulating Cement. I believe this contains only cement and mineral wool (rock wool) with no asbestos but have written Eagle-Picher for confirmation.

D.R. Dewart

DRD:jk

cc: W. Schilling

ALCOA0000009588

EXHIBIT A1

2.89#

40" x 6' x 1/8, #M4V7 asbestos sheet packing

1-4-75

75 FOR
SIR NO.
SP.

R/M #703

3/8 x 2" wide Raybestos tadpole gasket packing

BIN

75 FOR
SIR NO.
SP.

1" R&M #250

twisted abesto packing

75 FOR
SIR NO.
SP.

3/4" R&M #250

twisted abesto packing

75 FOR
SIR NO.
SP.

1/4" R&M #250

twisted abesto packing

BIN

GEANT WILSON

75 FOR
SIR NO.
SP.

1/16" x 1"

Grade AAAA non-metallic asbestos packing

BIN

75 FOR
SIR NO.
SP.

#8785N3

EXTRA HEAVY ASBESTOS CLOTH 1/8" x 36"

STD. PACK. QUAN.

STATE SALES OR USE TAX-EXEMPT ☐ NON EXEMPT ☐

BIN

SPECIFICATION

75 FOR
SIR NO.
SP.

R/M #250 3/8"

R/M #250 3/8" DIA. TWISTED ASBESTOS ROPE

STD. PACK. QUAN.

STATE SALES OR USE TAX-EXEMPT ☐ NON EXEMPT ☐

BIN

SPECIFICATION

75 FOR
SIR NO.
SP.

1" x 2"

WOVEN ASBESTOS GASKET MATERIAL

April 12, 1976

Owens-Corning Fiberglas Corp.
General Offices
Toledo, Ohio 43601

Gentlemen:

We use your Kaylo and Kaylo 20 in our plant but have lately become concerned about the OSHA regulations concerning asbestos. We note that these insulations were "rigid hydrous calcium silicate insulations reinforced with asbestos fibers."

Thus, we would like any general information you could supply about the asbestos content, including the following:

- 1). Does your Kaylo products today contain asbestos?
- 2). If so, how much, approximate fiber length, etc.?
- 3). Do you furnish any special literature concerning it - handling to minimize asbestos fibers from getting airborne?
- 4). If Kaylo has asbestos, do you market any similar product that has no asbestos?

Your early reply will be appreciated.

Very truly yours,

REA MAGNET WIRE COMPANY, INC.

D.R. Dewart
Plant Engineer

DRD:jk

ALCOA0000009590

April 12, 1976

Eagle-Picher Industries, Inc.
580 Walnut Street
Cincinnati, Ohio 45202

Gentlemen:

We use a fair amount of your Eagle-Picher Super "66" Insulation Cement throughout our plant. Lately we have become concerned about asbestos content in various products due to its attention by OSHA. Therefore, we would like to know whether there is any asbestos in your Super "66" product.

Thank you.

Very truly yours,

REA MAGNET WIRE COMPANY, INC.

D.R. Dewart
Plant Engineer

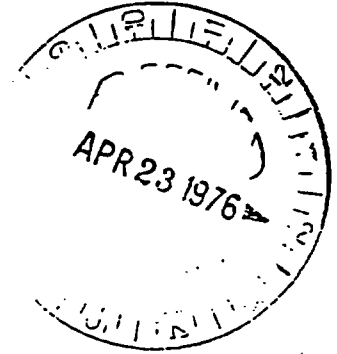
DRD:jk

ALCOA0000009591

Nancy W.

EAGLE **EP** PICHER

April 19, 1976



Mr. D. R. Dewart
Rea Magnet Wire Company, Inc.
3600 East Pontiac St.
Fort Wayne, Indiana 46806

Subject: Super "66" Insulating Cement

Dear Mr. Dewart:

We acknowledge receipt of your April 12 letter regarding our subject product. We are pleased to certify that Eagle-Picher Super "66" Insulating Cement as well as all products manufactured by the Fibers Department of Eagle-Picher Industries, Inc., is completely asbestos-free in content.

We trust this is the information required and that you will contact us if we can be of service in any other way.

Sincerely,

CHEMICALS AND FIBERS DIVISION
Eagle-Picher Industries, Inc.

Donald J. Birmingham

Donald J. Birmingham
Administrative Assistant
Fibers Department

DJB/sm

cc: Mr. E. W. Hall

Nancy Williams
Here are some
one of our products
2 Dewart 4/19/76

Eagle-Picher Industries, Inc.

CHEMICALS AND FIBERS DIVISION P.O. Box 779 Cincinnati, Ohio 45201 513-721-7010

ALCOA0000009592

TELEGRAM

This Copy for ☐ TELEGRAPH OFFICE ☒ FILE ☐ CONFIRMATION ☐

POINT OF ORIGIN & DATE: PITTSBURGH OFFICE 12MAY76

TO:

J. B. CHAPPELL
ALCCA
GOWERTON
SWANSEA, WALES

CC: H. J. CAPRIO, PITTSBURGH

REURLET 28APR76 ALTERNATIVES TO ASBESTOS. THANK YOU FOR INFORMATION.
PLEASE ADVISE IF YOU LOCATE ALTERNATE FOR ASBESTOS GLOVES.

ROBERT P. CARTER
ALUMINUM COMPANY OF AMERICA, PITTSBURGH

RPC: lmn

SF-1202 REV. 1-71

ALCOA0000009594

FROM J.B. CHAPPELL
Training and Safety Officer.

TO MR. ROBERT P. CARTER
Health and Environment
Department,
Pittsburgh Office 7AB.

JBC/AET.

28th April 1976.

Alternatives to Asbestos

We recently received a copy of your letter of 30th March 1976 via our Purchasing Manager, Mr. J.M.S. Roberts, and felt that we should inform you of the action that has been taken to eliminate where possible the use of asbestos on this site.

In metal melting and pouring operations:

1. Replacing the seal between static and portable pouring launders with Kaowool, a proprietary brand of ceramic fibre.
2. Using Ciment Fondue and crushed refractory brick instead of rammed asbestos fibre or Marinite board as launder lining.
3. Substituting hand-formed furnace tap-hole plugs made from dampened asbestos fibre with pre-formed Fibrefax Cones, made from Aluminium Silicate.
4. We are still using pre-machined (at the supplier's) Marinite components for pouring floats (distributors) which we assemble prior to use, but are endeavouring to improve handling, transportation and storage to reduce minor damage and the subsequent dust and small particles arising from poor housekeeping.

Elsewhere in the plant we are examining protective clothing, e.g. gloves, for handling hot rolled plate and seeking alternatives.

As a result of information recently released in this country there has been a spate of reports in the media and we enclose photocopies of articles reproduced in two of our more responsible national daily newspapers, The Times and The Daily Telegraph.

We will keep you informed of future developments.

Encs:

J.B. Chappell



ALCOA

ALCOA OF GREAT BRITAIN LIMITED

ALCOA0000009595

KILLER ASBESTOS FACTORY 'FAILURE' BY INSPECTORS

DAILY TELEGRAPH REPORTER

SIR ALAN MARRE, the Ombudsman, has taken Government factory inspectors to task for their handling of a "killer" asbestos factory at Hebden Bridge in Yorkshire.

In a 45-page report released yesterday, Sir Alan concludes that "the quality of the attention given to Acre Mill was not as high as it could and should have been."

He strongly suggests the inspectors should have prosecuted the owners for failing to implement adequate dust control measures.

Community leaders in West Yorkshire claim that 40 former employees have died and more will die from the lung disease asbestosis contracted at the Acre Mill plant, closed down by its owners in 1970.

Lawyers representing the workers say that Cape Industries, which ran the factory, have paid out some £2 million in damages in the past six years. All but two of the cases have been settled out of court, with the highest single compensation figure standing at £35,000.

Fresh concern

In Hebden Bridge yesterday there was fresh concern over the dumping of asbestos waste in the neighbourhood.

A junior and infant school 100 yards from one of the biggest tips has halted nature walks in the area, and members of a local Asbestos Action Committee are pressing the West Yorks County Council to cover the asbestos waste.

The Ombudsman's report is certain to be used by MPs to demand a public inquiry into the continuing tragedies at Hebden Bridge and to investigate the benefits and hazards of asbestos.

"I shall use this as a battering ram to get a very urgent public inquiry into all aspects of asbestos," said Mr. Max Madden, Labour MP for Sowerby, who brought the issue to the Ombudsman a year ago.

"The community should be able to decide whether the risks are acceptable in the light of the benefits of asbestos."

Lungs scarred

Asbestosis results from the scarring of the lungs by tiny dust particles. There is no known "safe" limit for the estimated 100,000 people working closely with asbestos, and the disease can take as long as 15 to 25 years to mature.

The Ombudsman's report tackles only the role of Government factory inspectors.

"I think that the district staff at Halifax—the responsible inspectors—could and should have shown greater determination at various times over several years to put further pressure on the management at Acre Mill," Sir Alan said in the conclusion to his report.

"I am not convinced that they were sufficiently decisive either in conveying to the management the sense of urgency that was appropriate or in pursuing the question of a prosecution when, over a period of years, improvements were not forthcoming."

'Model' plant

The report discloses that Acre Mill was for a time regarded by local factory inspectors as a "model" plant to which trainee inspectors were taken to demonstrate the working of regulations for the asbestos industry. Regulations framed in 1931 were tightened in 1969.

Sir Alan's year-long investigations into Acre Mill show that inspectors' reports on the plant were peppered with criticisms for almost 20 years.

The threat of prosecution was mooted at least three times, and one former factory inspector told the Ombudsman that he would "probably" have reconsidered taking Cape to court had he not been transferred from the area in 1966.

The report quotes the minutes of a conference held by the chief factory inspector last year "that with hindsight it might have been better to have allowed the district inspector to prosecute."

'Over friendly'

But the Ombudsman exonerates the factory inspectors, now part of the Health and Safety Executive, on

a series of allegations which included the improper destruction of files relating to Acre Mill, the failure of Cape Asbestos to display factory regulations at the plant and an "over-friendly" relationship between the inspectors and the Acre Mill management.

Mr Madden yesterday dismissed Government plans to mount a review of the latest asbestos regulations as an insufficient response to the Ombudsman's report.

"We do not want a hole-in-the-corner review conducted in secret. In my view, the whole thing should be dragged out into the open, and an inquiry should be conducted in public," he said.

"I feel that if the asbestos industry is confident of the quality and the benefits of its product and have taken the action they should have done under the 1969 regulations, then they should have nothing to fear from such a public inquiry," Mr Madden added.

'Pretty mild'

Mr John Pickering, the Manchester lawyer who has represented most of the Acre Mill workers in damages suits, said that the Ombudsman's report, which did not deal with Cape's involvement, was "pretty mild."

"Those who have had to deal with this know what an absolutely appalling problem it is. There are a colossal number of cases, and the problem is far greater than is generally accepted."

A spokesman for Cape Industries said yesterday that the closure of Acre Mill in 1970 was "for economic and commercial reasons" and was unconnected with the incidence of asbestosis.

The spokesman added that it would "not be appropriate" for the company to comment on the Ombudsman's report, which dealt with the factory inspectors' rate.

ASBESTOS
DANGER
'TO 200'

By PETER GILL

A FRESH investigation into the health hazards of asbestos has been promised by the Government after the release yesterday of a report on the "killer" asbestos plant at Hebden Bridge, Yorkshire.

Sir Alan Marre, the Ombudsman, says in his report that there were 50 reported cases of the lung disease asbestosis between 1954 and the closure of the Acre Mill factory in 1970.

But those figures were branded yesterday as "a massive understatement of the position" by Mr. Max Madden, Labour MP for Sowerby, who brought the Acre Mill case to the Ombudsman.

Mr Madden said that 40 former employees at the plant, which opened in 1933, had died and a further 200 were suffering from asbestosis—caused by asbestos particles scarring the lungs.

Report accepted

Mr Harold Walker, Under-Secretary for Environment, said yesterday that he accepted the Ombudsman's criticisms of the factory inspectors who handled Acre Mill and the Chief Inspector of Factories agrees with him. But even with the difficulties they then faced, they could have enforced the regulations more rigorously.

Dr Bertram Mann, the consultant chest physician who diagnosed nearly all the cases of asbestosis arising from Acre Mill said yesterday he feared there could be up to 550 cases of the disease in the area over the next 15-20 years.

He said that there were 57 new cases in 1974 and 25 cases last year.

Dr Mann said that about six people who had the disease had not worked at the factory but were only resident in the area.

Report—P5

Safety move after new asbestos link with cancer

By Neville Hodgkinson

An urgent review of precautions surrounding the use of asbestos has been started by the Health and Safety Executive in the light of a growing body of evidence that it is a potent cause of cancer.

In certain forms it is feared to be a threat to the public as well as to those working with it; yet because of its resistance to heat and acid it is in widespread household and industrial use.

Factory inspectors are being asked to report on the degree of compliance with and difficulties of enforcement of the Asbestos Regulations of 1969. There is particular concern over demolition and dismantling work, because of the large amounts of asbestos dust that may be released into the atmosphere.

The Asbestos Regulations do not specify obligations to those who are not work people, and an extension of the Health and Safety Executive's powers may be sought to improve the protection given to the public.

Warnings to home handymen about the dangers of inhaling the dust while working with asbestos products, and of the need to seal them to prevent fibres flaking off and contaminating the home, are being worked out between the Department of Prices and Consumer Protection and the asbestos industry, with help from the Employment Medical Advisory Service.

It is nearly eight years since a recommendation that such warnings should be issued was made by the standing subcommittee on cancer of the Department of Health's standing medical advisory committee.

In a confidential report entitled *Control of the cancer hazard due to asbestos to the general population* the committee said it had been shown that mesothelioma, a malignant tumour originating in the lining of the chest or stomach, could be produced by slight exposure to asbestos, and that on present knowledge it had to be assumed that no amount of exposure was completely free from the risk.

The report, which has only just come to light, added: "The use of asbestos is so widespread that it is not practicable to reduce exposure by protecting individual members of the public and efforts should be concentrated on reducing the amount of asbestos dust in the atmosphere."

When the advisory committee's report was written, the observed annual incidence of mesothelioma deaths had risen

Continued on page 2, col 6

Precautions are urged over asbestos

Continued from page 1

to about 120 a year, compared with a total of 200 cases recorded over the 15 years up to 1956. The number is now running at more than 200 a year, but because of difficulties in diagnosis the true incidence may be much higher.

Stringent precautions are taken to keep down the level of dust among workers regularly exposed to asbestos. Because of inadequate standards in the past, hundreds of workers have died and still are dying from asbestosis, scarring of the lungs caused by inhalation of asbestos fibres.

The condition is irreversible, untreatable, progressive, and often disabling or fatal.

A maximum level of exposure of two fibres a cubic centimetre of air was laid down in the 1969 regulations on the basis of advice from the British Occupational Hygiene Society.

However, doubt has been raised whether that is low enough; the United States Department of Labour has recently proposed a cut in the standard of five fibres to half a fibre a cubic centimetre.

Several retrospective studies have shown that in dusty con-

ditions asbestos workers run a greatly increased risk of developing lung cancer and that the dustier the conditions the greater the risk. Cigarette smoking enhances the danger. Abnormally high incidences of cancer of the oesophagus, stomach, colon and rectum have also been discovered.

Dr Irving Selikoff, of New York, a pioneer in asbestos epidemiology, has suggested that asbestos may cause cancers at other sites, including the brain, pancreas, and the genitourinary area. Asbestos fibres have been found after death in various tissues and organs.

ALCOA0000009597

PITTSBURGH PURCHASING
INDUSTRIAL & PACKAGING
MATERIALS - 19

MR. B. W. MOORE
VANCOUVER OPERATIONS

27APR76

RE: ALTERNATES FOR ASBESTOS

This is in reference to your letter of 12APR76 requesting possible candidates for replacing asbestos tape for rack liners and separators.

Y
P
O
U
Your unsuccessful attempts with fiberglass materials leaves us with few alternatives - all of which are expensive. One material which may be of interest is Refrasil, a refractory silica in textile form. This material is available in many forms including tape and for special applications can be coated with Teflon and/or other selected materials. Refrasil is obtained through Materials Division of HITCO a subsidiary of Armco Steel Corp. The west coast address is: Hitco Materials Div., 1600 West 135th Street, Gardena, California 92047. The contact at that location is Don Woldy at (213) 532-0870.

Another possible candidate is ceramic fiber such as Carborundum's Fiberfrax, Johns-Manville's Cerafelt or Babcock and Wilcox's Kaowool. Information on these materials can be obtained through your local representatives.

The big obstacle in asbestos replacements is accepting the fact that this switch may increase the initial cost tenfold or more. However, the asbestos-free materials which are compatible with a specific application usually outperform asbestos with respect to service, durability, temperature, and resistance to chemical attack.

If there are any questions on this matter, please feel free to contact me.

M. J. CAPRIO

MJC:gih

cc: G. P. Nelson - Vancouver Wks.
D. L. Werner - Vancouver Wks.
D. M. Wooden - Vancouver Wks.
R. P. Carter - AB 7

Copy 28Apr76 to W. J. Bovard, Vancouver

B. W. MOORE
VANCOUVER OPERATIONS

MR. M. J. CAPRIO
PITTSBURGH OFFICE

April 12, 1976

RE: ALTERNATES FOR ASBESTOS
Ref: Letter, R. P. Carter to W. J. Bovard, as above, March 30, 1976

As requested in the referenced letter, the following information is given concerning the Vancouver Extrusion Mill's need for asbestos replacement material.

Y
L
O
U
Vancouver, for years, has used an asbestos paper tape for rack liners and separators on special surface finish extrusions in the T52 temper. While our use of asbestos paper tape has been small, it is another source of asbestos fibers, which we must eliminate from the operation.

The asbestos paper tape, which we have been using, is 1/16 inch thick by 3-1/2 inches wide and is used in approximately 30 inch and 90 inch lengths.

Our requirement for an alternate material must have the following properties.

1. Withstand 550° F
2. Be non-staining to aluminum - i.e., no outgassing of binders.
3. Be non-abrasive to aluminum - i.e., not produce burnish marks.
4. Not have irritant producing properties such as some loosely woven fiberglass materials have.
5. Cost and life of material - number of times it can be reused directly related to cost of material.

We have looked at many fiberglass materials and coatings for aluminum spacers. To date, we have not found a satisfactory replacement.

B. W. MOORE

BWM:ms

cc: Mr. G. P. Nelson, Vancouver Operations
Mr. W. J. Bovard, Vancouver Operations
Mr. D. L. Werner, Vancouver Operations
Mr. R. P. Carter, Pittsburgh Office

~~E. S. BROWN~~

→ TBB
RPC
from RTH

FROM G. D. SCHNITTGRUND
CERAMIC SECTION
ALCOA TECHNICAL CENTER - B

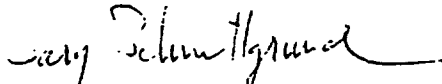
TO MEMORANDUM

February 27, 1976

RE: JOHNS-MANVILLE'S NEW PRODUCT, MARINITE XL

The attached data letter and manufacturer's data sheet discuss Marinite XL, an asbestos-free board having physical properties similar to asbestos-bearing Marinite 36, now commonly used throughout the Laboratories as an insulating board in applications below 1000°F.

To reduce the asbestos hazard, it is recommended that Marinite XL be substituted for Marinite 36 in all possible non-metal contact applications. As mentioned in the data letter, the Ceramic Section will evaluate Marinite XL for molten aluminum contact in the near future.


G. D. SCHNITTGRUND

GDS:lg

cc: Associate/Assistant Directors
Division/Department Managers
A. S. Russell

 ALCOA

ALCOA0000009605

FROM: G. D. SCHNITTGRUND
CERAMIC SECTION
ALCOA TECHNICAL CENTER - B

TO MEMORANDUM

February 27, 1976

RE: DATA LETTER
JOHNS-MANVILLE'S NEW PRODUCT, MARINITE XL

SUMMARY

The captioned rigid insulating board was evaluated as an asbestos-free replacement for Marinite 36. The Marinite XL sample exhibited lower bending strengths, greater loss on ignition; and higher values of linear change as a function of firing temperature than Marinite 36. However, up to 1000°F XL can be used in a wide variety of industrial applications.

INTRODUCTION

Johns-Manville's Marinite XL can be handled, cut, and fabricated without environmental concerns for the asbestos dust hazard. XL is a calcium silicate bonded material currently selling for \$78.94 per 48 x 96 x 1 inch thick board. It is also available in 1/2 and 3/4 inch thicknesses. This price is comparable to \$74.50 per 1 inch board for Marinite 36.

RESULTS AND DISCUSSION

Table I lists ATC test results for Marinite 36 and XL. Despite XL's increased density (45 pcf) compared to that of Marinite 36 (36 pcf), XL's strength as measured on a 1 x 1 x 10 inch sample in three-point bonding over a 9 inch span, is lower due to the absence of asbestos fibers. With increasing firing temperatures, the weight loss was due to an initial loss of free water and organics burn-off and then the dehydroxylation of the calcium silicate hydrate binder. The loss of chemically combined water resulted in a strength decrease and linear shrinkage increase. The cold strength of Marinite XL began to increase after firing at 1400°F and 1500°F due to the development of a glassy phase.

CONCLUSIONS AND RECOMMENDATIONS

Marinite XL board is a reasonably priced asbestos-free product having adequate physical properties to perform as a substitute for Marinite 36 in most non-molten metal contact applications.

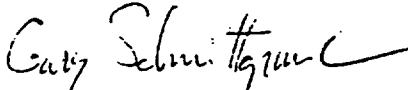
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Memorandum
February 27, 1976
Page 2

Data Letter - Johns-Manville's New Product, Marinite XL

In the near future XL will be evaluated for potential use in contact with molten aluminum.


G. D. SCHNITTGRUND

GDS:lg

cc: M. J. Caprio, Pgh.
J. C. Fisher/C. F. Hartley, Pgh.
R. W. Wrenn /J. A. Dunbar, Pgh.
J. Z. Nelson/A. J. Sartschev, Pgh.
D. L. Schaffer/M. L. Redhair, Pgh.
J. M. Lehigh, Tennessee
R. Spear/G. K. Turnbull
L. K. Hudson/R. G. Lark, Ceramic Section 96W310

TABLE I - ATC TEST RESULTS

<u>Temperature (°F)</u>	<u>Bulk Density (pcf)</u>	<u>Weight Loss (%)</u>	<u>Linear Shrinkage (%)</u>	<u>Pandux Hardness</u>	<u>Modulus of Rupture (psi)</u>
<u>MARINITE 36</u>					
As Received	36	-	-	61	960
230	-	-	0.07	-	-
1200	-	4.6	0.28	63	730
1400	-	7.3	(0.8)*	58	-
1600	-	7.8	(13.0)*	*	-
<u>MARINITE XL</u>					
As Received	45	-	-	69	652
230	-	1.4	0.07	70	-
1200	-	11.4	0.65	64	397
1400	-	12.1	0.92	63	405
1500	-	13.4	(6.48)*	*	486

*Sample bowed excessively during firing.

JOHNS-MANVILLE
+ PRELIMINARY PHYSICAL PROPERTIES
MARINITE XL - INDUSTRIAL MARKET

	J-M MARINITE - XL	MARINITE 36 TYPICAL VALUES	FINISHED PRODUCT SPECIFICATION
Normal Moisture - %	3.5	3.0	5 Max.
Density - pcf	44.6	36	33 - 39
Modulus of Rupture - psi	810	1200	1000 Min.
Screw Holding Strength - lb 1/2" penetration	133	150	100 Min.
7/8" penetration	-	300	250 Min.
Pandux Hardness - Units	60	62	55 Min.
Shrinkage - % (5 hr @ 1000° F)			
length & width	0.7	0.6	1.0 Max.
thickness	1.5	1.6	2.0 Max.
(5 Hr @ 1100° F)			
Length & Width	0.7	0.7	* 1.2 Max.
Thickness	1.4	1.7	* 2.2 Max.
Ignition Loss - 1800 F - %	12.8	9	15 Max.
Consolidation - inches/inch	0.016	0.020	0.025 Max.
Thermal Conductivity	**		
BTU - in/hr/sq ft/°F			
100° F	0.74	0.76	0.84 Max.
200° F	0.75	0.77	0.85 Max.
400° F	0.77	0.79	0.87 Max.
600° F	0.79	0.81	0.89 Max.
800° F	0.82	0.84	0.91 Max.
1000° F	0.86	0.86	0.95 Max.

** Test Density 44 pcf

* Specification for Molten Metal Marinite

+ Based on limited production runs. Properties will be amended as production experience is gained.



2 February 1976

Environmental Elements Corporation
P. O. Box 1318
Baltimore, MD 21203

Attn: Mr. William J. Meier, Contract Administrator

RE: Electrostatic Precipitator
Alcoa P. O. No. EN-232033-BR
Environmental Elements S.O. 370775

Ref: Installation of Asbestos Gasket

Dear Mr. Meier:

Thank you for your letter dated 28 January 1976 wherein you transmit Mr. Schell's letter to OSHA and their response.

There is still one area of concern regarding the use of asbestos rope for gasketing material in this application. It is our understanding that the rope will be shipped in coil form. At the jobsite, the asbestos rope must be uncoiled, cut, and handled until such time as it is dipped into the red lead paint. Once the material has been dipped in the paint, all asbestos fibers should be securely bound and the material should then be safe to handle for installation.

It is the preparation for painting which concerns us. How is it possible to uncoil, cut, and handle this asbestos rope without exposure to airborne concentrations of asbestos fibers?

In preparing your comments in this regard, please feel free to call us and discuss any questions which arise.

Very truly yours,

R. C. Cook
R. C. COOK
Staff Environmental

RCC/rmb

cc: ~~R. P. Carter - AB 7~~
R. J. Guilloud - AB 2
T. G. O'Shaughnessy - Bauxite
H. R. DeVore - AB 22

ALCOA0000009621

FROM R. G. LA BAR
CERAMIC SECTION
ALCOA TECHNICAL CENTER - B

TO MR. H. MC LAUGHLIN
DAVENPORT

~~+BD~~
RPC

December 23, 1975

RE: ASBESTOS FREE TROUGH LININGS

In reply to J. A. Dunbar's telegram, Bill Keith and I have worked together for over one year experimenting with phosphate bonded plastics, insulating phosphate bonded plastics, insulating moldables such as JM-375L, LDS and variations of JM-375, damp rammed Wahl SJP. In short, these materials failed to provide adequate performance. The main reason as I understand it is that trough linings (melter-holder) must be made between transfers. Unless spare troughs are constructed, lined, properly dried and preheated (as is the practice at Massena, Warrick, Lafayette, etc.) performance will not be acceptable. Bill has sufficient information on alternate materials, installation, and heatup procedures if and when spare troughs can be purchased.

R. G. La Bar

R. G. LA BAR

RGL:lg

cc: J. A. Dunbar, Pgh.

~~R. P. [unclear]~~

A. J. Sartschev, Pgh.

R. W. Wrenn, Pgh.

D. L. Schaffer, Pgh.

M. L. Redhair, Pgh.

R. A. Cheatham, Pgh.



ALCOA

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TELEGRAM

~~FB B~~
rp c

This Copy for TELEGRAPH OFFICE FILE CONFIRMATION

POINT OF ORIGIN & DATE: DECEMBER 18, 1975

TO: H. McLAUGHLIN - DAVENPORT WORKS

PER OUR PHONE CONVERSATION THIS DATE ON USE OF ASBESTOS LUMNITE IN
MELTER-HOLDER TRANSFER TROUGHS. UNDERSTAND YOU STILL HAVE 6-8 TROUGHS
LINED WITH THIS MATERIAL STILL IN USE, BUT THAT NEW TROUGHS WILL BE
LINED WITH ONE OF THE SUBSTITUTE MATERIALS. BY MEANS OF A COPY OF
THIS WIRE TO DICK LABAR, I AM REQUESTING THAT HE FORWARD TO YOU A
MATERIAL AND INSTALLATION RECOMMENDATION FOR THIS APPLICATION BASED
ON RESULTS AT OTHER PLANTS, NOTABLY MASSENA.

J. A. DUNBAR

JAD:skm

cc: R. G. LaBar - Alcoa Technical Center
R. P. Carter - Pittsburgh, 7
~~A. J. Sartachev - William Penn Hotel, 3~~

File routed: RWW, DLS, MLR, RAC, JAD

SP 12-1 WE 11-1

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