

File

UNION CARBIDE CORPORATION

Engineering, Manufacturing and Technology Services

39 Old Ridgebury Road
Danbury, CT 06817-0001

①

TO: Mr. J. E. Sanders
So. Chas., WV
LOC. 511

DATE: February 17, 1987

SUBJECT: Recommended C & P
Program - Asbestos
Containing Materials

The task group recommendation to phase out the use of asbestos containing materials in C & P locations, transmitted to me on October 14, 1986, is accepted. You should proceed to revise the appropriate engineering standards.

BGP/pmc
Attachment

BG Perry
B. G. Perry

Accepted by Manuf. Council. per B.G.P.



INTERNAL CORRESPONDENCE

Engineering, Manufacturing, and Technology Services
Central Engineering
Technical Center

Post Office Box 8361
Building 2000
South Charleston, WV 25303

October 14, 1986

RECEIVED

TO: Mr. B. G. Perry
COPY TO: Mr. P. D. Franson
Dr. P. R. Kavasmaneck
Mr. W. G. Lilly, Jr.
Mr. C. C. Neely
Mr. S. W. Turicchi

OCT 23 1986

S. W. TURICCHI

SUBJECT: Recommended C&P Program - Phase-Out Use of
Asbestos-Containing Materials in Workplace

RECEIVED

OCT 20 1986

B. G. PERRY

Bob:

In July of this year, you requested on behalf of the Manufacturing Council that a Task Group be assembled to evaluate the implications for Chemicals and Plastics of continued use of asbestos-containing materials in the workplace. You should be aware that asbestos-containing insulation materials were prohibited for new construction and for replacements beginning in 1976.

The Task Group, headed by Mr. C. C. Neely, Corporate Fellow - Engineering Mechanics, was comprised of the following individuals and areas of expertise.

L. E. Calvert	- Maintenance
S. W. Clark	- Health/Safety
G. B. Elder	- Corrosion-Materials
R. W. Engle	- Valve and Piping Technology

The Task Group has surveyed current and projected industry practices with regard to the use of asbestos-containing materials and has evaluated current government regulations and made judgements with regard to future regulations which could impact on the use of and cost of use of asbestos-containing materials. Additionally, the Group evaluated the availability and cost effectiveness of substitute materials.

Mr. B. G. Perry
Page 2
October 15, 1986

Based on available evidence that airborne asbestos in the occupational workplace has proven to be a carcinogen and that cost effective alternative materials are available, or can be developed with relative ease, the Team has recommended that C&P continue to phase out the use of asbestos-containing materials with no purchase or installation of asbestos-containing materials, without a formal variance, after January 1, 1989. Asbestos-containing materials that are in use and retain their structural and functional integrity need be replaced only if this integrity is compromised, or when normal maintenance occurs.

Other recommendations are contained in the attached draft of the C&P Recommended Program.

I want to thank the Task Group for their efforts in this study and for their breadth of judgement as reflected in the recommendation.

Please let me know of further work you require, or of any questions you may have.

Very truly yours,



S. E. Sanders

JES:he
Attachment
4701Y

OCT 15 1986

J. E. Sanders

UNION CARBIDE CORPORATION

Engineering, Manufacturing, and Technology Services
Central Engineering

P. O. Box 8361

So. Chas., WV 25303

BUSINESS CONFIDENTIAL

September 30, 1986

TO: Mr. J. E. Sanders

COPY TO: Mr. L. C. Calvert
Mr. S. W. Clark
Mr. G. B. Elder
Mr. R. W. Engle

FROM: C. C. Neely

SUBJECT: Final Draft of Recommended C&P Program
Phase-Out Use of Asbestos-Containing Materials in Work Place
Chemicals and Plastic Group

Attached herewith on behalf of the Special Working Group is a copy of the subject document dated 9/29/86. It is a slightly fine-tuned version of the 8/28/86 version which was transmitted to you under my transmittal also dated 8/28/86. The changes that have been made are of a clarifying rather than substantive nature.

At this point, we have not made an effort to obtain broad, formal review of the subject program. However, Larry Calvert has discussed it briefly with the Maintenance APM's and Maintenance Managers. In addition, Stan Clark arranged for its review by the Safety, Health Advisory Committee (SHAC), and your staff has reviewed it. Feedback indicates these groups to be supportive of the concept, but some have expressed concern regarding the January 1, 1989 date specified for the discontinuance of the purchase of asbestos-containing materials, believing it to be optimistic. Some of the concern relates to the following:

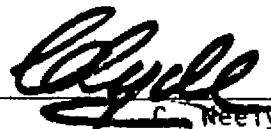
1. CED's ability to revise and reissue the V&P Specifications and the Valve Manual in time to support the deadline. The responsible CED specialists have carefully reviewed this matter and believe that reissuance of these Manuals by July 1, 1988 is realistic. This date has not been published, however.

September 30, 1986

2. Belief that field testing of new gasket and packing materials will be required. Such testing will not be necessary since the plan at this time is to accommodate most of the substitutions by broadening the use of materials already in use, materials such as reinforced Teflon and GRAFOIL™. This plan has not been broadly disseminated, and we can fully appreciate the reluctance to agree to a purchasing cut-off date for asbestos-containing products without knowing what the substitutes are. We also appreciate that, once this material substitute plan is known, there will be a natural resistance due to the higher first cost of these substitute materials.
3. Some belief that installers will need special training to handle the new gasket and packing materials. For reasons cited in (2), we do not believe this requirement will be significant.
4. Perhaps lack of understanding that the January 1, 1989 date is the cut-off date for the purchase of asbestos-containing materials except as approved by a variance.
5. "Is this really necessary" attitude. The Special Working Group believes that OSHA's recently revised exposure limit of 0.2 fibers per cubic centimeter of air (was previously 2.0 fibers per cubic centimeter) add significant impetus to implement the proposed Recommended Program. According to Terry Hanning's September 5, 1986 memorandum (copy attached), labor union representatives do not believe that controlling the exposure limit to this lower level provides adequate protection.

The above concerns notwithstanding, the Special Working Group decided to submit the subject Recommended Program to you with the January 1, 1989 date included since we believe that, with proper communication with the key plant personnel responsible for its implementation, along with management support, this date is realistic and achievable. We are submitting under separate cover a proposed CED Technology Program which includes request for funds to cover the important communications aspect of the understanding, acceptance and implementation process.

Please let me know how we can be of further assistance regarding this matter.


C. Neely

CCN:mr
4319I
Attachment

D R A F TRECOMMENDED POLICYCHEMICAL AND PLASTICS BUSINESS GROUP (C&P)

SUBJECT: USE OF ASBESTOS-CONTAINING MATERIALS⁽¹⁾ IN THE WORK PLACE

PURPOSE/BACKGROUND

The Corporate Charter (1.1) contains the following commitment to employees:

"To provide working conditions, programs of training and education, and persistent review and appropriate modification of facilities and practices to protect the health and safety of employees."

It also contains a social commitment to conduct business "in accordance with all the applicable national and local laws and regulations."

As a result of available evidence that airborne asbestos in the occupational environment had proven to be carcinogenic in man, all C&P Insulation Standards were revised in 1976 to specify only asbestos-free insulating materials; and new or replacement installations of these materials have subsequently been selected accordingly. Additionally, a Safety/Health Standard designated SH-256 was prepared covering the safe removal and handling (includes disposal) of asbestos-containing insulating material during renovation and demolition. The requirements of this Standard equal or exceed those of current applicable government standards.

OSHA's rule-making efforts relative to asbestos usage in the work place are mired in controversy. Hearings on the latest EPA proposal which includes the phaseout of all asbestos over a ten-year period are now in progress. The proposal states: "EPA is considering banning the manufacture, importation, and processing of asbestos construction products and asbestos clothing soon after the rule's promulgation with the category of asbestos friction products banned about five years later, and other asbestos products banned at a later time." Gaskets and packing that contain asbestos are in the category of "other asbestos products" that would apparently be banned after ten years. No peer company that we are aware of has a target date for removal of existing asbestos-containing insulation, gaskets, or packing; however, one major chemical company has recently discontinued the purchase of asbestos-containing gaskets and packing.

A cost analysis of pipe-size gaskets shows that GRAFOIL®, probably the most expensive of the acceptable gasket substitute materials, is, in fact, cost effective when only the cost of mandatory work practices associated with the use of asbestos (e.g. wetting for removal or airborne fiber

⁽¹⁾"Asbestos-containing materials" include but are not limited to insulation, gaskets, packing, welding blankets, and building materials.

D R A F T

-2-

exposure monitoring during removal, placing in labeled plastic bags after removal, landfill disposal, and record keeping) is considered. The same conclusion is drawn relative to valve packing when the additional considerations of improved service life and sealability are included.

Consistent with the aforementioned commitments and the economic use of materials, C&P has concluded that positive actions relative to asbestos-containing materials⁽¹⁾ should be taken.

POLICY

Except as otherwise provided by applicable law, Chemicals and Plastics Business Group will:

Continue to phase out the use of asbestos-containing materials:

- Asbestos-containing insulation shall be replaced with asbestos-free materials as required to maintain structural and functional integrity.
- No asbestos-containing materials shall be purchased after January 1, 1989.
- C&P approved practices shall be employed for the identification, removal, modification, and/or disposal of asbestos-containing materials.
- Evaluation of asbestos substitute materials shall include consideration of health effects as well as suitability for intended service and cost.
- A variance approval procedure shall be employed to cover consideration of uncommon circumstances. Approval must always include endorsement of C&P HS&EA management.

SCOPE

This recommended policy applies to all C&P operated/hosted facilities. Other components of the Corporation will be apprised of its content.

DELEGATION

The assignment of duties and authority to carry out the policy defined herein is delegated as follows:

To Central Engineering Department

- Develop and maintain engineering standards covering:
 - Identification of asbestos-containing materials;

D R A F T

-3-

- Removal, modification and/or disposal of asbestos-containing materials; and
- Use of asbestos-substitute materials.

To Site Management

- Implement policies and practices for the identification, removal, modification, and disposal of asbestos-containing materials.
- Use of CED Standards covering asbestos substitute materials and the communication of service experience with these materials.

To Manufacturing Services

- Monitor use of asbestos-substitute materials and the communication of service experience with these materials.

To C&P HS&EA

- Audit compliance with governmental regulations and CED-developed standards relating to asbestos-containing materials and, where applicable, their substitutes.

C. C. Neely
2073W

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File Asbestos

IN FILE 100-100000

JUL 9 1987

J. E. S.

UNION CARBIDE CORPORATION

Engineering, Manufacturing, and Technology Services
Central Engineering

P. O. Box 8361

So. Chas., WV 25303

BUSINESS CONFIDENTIAL

July 9, 1987

TO: L. E. Calvert H. G. Clem, Jr. J. J. Polomski
S. W. Clark R. S. Holmes K. C. Schmidt
G. B. Elder D. L. Kurle
R. W. Engle R. W. Light
S. S. Murphree C. R. Morris
J. A. Reynolds

COPY TO: E. M. Bartrug, Jr. J. D. Griffith J. E. Neff
D. J. Dickson T. E. Hanning C. H. Pelanne
P. D. Franson T. E. Martin J. E. Sanders
G. E. Garrett Carey Neal

FROM: C. C. Neely

SUBJECT: Second Task Group Meeting
July 23, 1987, from 1:00 p.m. to 6:00 p.m.
Phaseout Use of Asbestos-Containing Materials in the Work Place
Chemicals and Plastics Group

The agenda for the subject meeting is attached. Please note the full agenda, including presentations by two GRAFOIL™ gasket experts from the UCC Specialty Products Group to help us settle some issues regarding style of GRAFOIL™ gasket versus service conditions. As you will also note, this will be a long meeting, and in appreciation for this extended effort, the agenda includes repairing directly to a restaurant of our choice (consensus) for a period of relaxation and dinner of your choice.

I personally look forward to our meeting and hope your schedule will allow you to attend as currently planned.

See you there.



C. C. Neely

CCN:aa

Attachment

43551

AGENDA
SECOND TASK GROUP MEETING
PHASEOUT USE OF ASBESTOS-CONTAINING MATERIALS IN WORK PLACE
CHEMICALS AND PLASTICS GROUP
TECHNICAL CENTER, BUILDING 2000, ROOM 4505
JULY 23, 1987
1:00 P.M. TO 6:00 P.M.

1. Call to Order.
2. Adoption of Agenda.
3. Announcements.
4. Funding for Task Group Work Beyond Scope of T&S Programs (CCN).
5. Home for Asbestos-Phaseout Program Document (CCN).
 - 5.1 See J. E. Sanders' June 22, 1987 memorandum (attached).
 - 5.1.1 Assignment to prepare generic Summary Statement.
6. GRAFOIL™ Gasket Selection vs. Service Conditions and Other Considerations.
 - 6.1 Leakage and Blowout Test Results for Various Grades of 1/16" thick GRAFOIL™ Gaskets vs. 1/16" thick Asbestos Composition Gaskets (KCS/JJP).
 - 6.1.1 Grade GHE (metal insert, tanged).
 - 6.1.2 Grade GHR (metal insert, adhesively bonded foil).
 - 6.1.3 Grade GHP (polyester insert, adhesively bonded).
 - 6.1.4 Grade GHL (no insert).
 - 6.2 Other Pertinent Comparative Test Data, Above Gaskets (KCS/JJP).
 - 6.3 Field Experience with Above Gaskets (KCS/JJP/GBE/OTHER).

- 6.3.1 Finger Cutting Problems with Grade GHE.
- 6.3.2 Leakage.
- 6.3.3 Allied/Dow/Monsanto (GBE).
- 6.4 Cost Considerations, above Gaskets (KCS/JJP/SSM).
 - 6.4.1 Type 316 Metal Insert.
 - 6.4.2 Other Insert Alloys (e.g., Hastelloy C-276).
- 6.5 Delivery Considerations, above Gaskets (KCS/JJP/SSM).
- 6.6 Stock Inventory Considerations With Multiple Grades of GRAFOIL™ Gaskets (LEC/SSM).
- 6.7 Quality Problems with Grade GHE.
 - 6.7.1 Type 316 vs. Other 300 Series Grades of Stainless Steel.
 - 6.7.2 Thickness of GRAFOIL™ Sheet.
- 6.8 Review of Service Conditions and Action Plans to Date, above Gaskets.
 - 6.8.1 Piping (RWE).
 - 6.8.2 Machinery (JAR).
 - 6.8.3 Pressure Vessels (DLK).
 - 6.8.4 Control Systems (CRM).
- 6.9 Preliminary Matching of GRAFOIL™ Gasket Grades with Service Conditions (ALL).
- 7. Fiber Exposure Data When Installing/Removing Asbestos Composition Gaskets/Packing (RSH).
- 8. Fire Safety Considerations.
 - 8.1 Teflon™, Teflon™-filled Spiral Wound Gaskets.
 - 8.2 Nonasbestos Substitute Materials.

9. Action Plan Development - Asbestos-Containing Materials Other than Gaskets and Packing.

9.1 We will use attachment to CCN's June 15, 1987 memorandum entitled "Background Data" as outline for this discussion (copy attached).

10. Asbestos in Mastics Used for Insulation Weather Barriers (HGC/GBE).

11. Status Report - Visual Identification Coding of Weather Barriers Installed Over Asbestos-Free Insulation (HGC).

C. C. Neely
July 9, 1987
4355I

UNION CARBIDE CORPORATION
ENGINEERING, MANUFACTURING, AND TECHNOLOGY SERVICES
Central Engineering
South Charleston, West Virginia

UCC BUSINESS CONFIDENTIAL
June 22, 1987

TO: C. C. Neely

COPY: L. E. Calvert
S. W. Clark
G. B. Elder
R. W. Engle
P. D. Franson
W. G. Lilly
S. S. Murphree

RECEIVED
JUN 22 1987
CCN

FROM: J. E. Sanders

SUBJECT: Phaseout of Asbestos Containing Materials

Clyde:

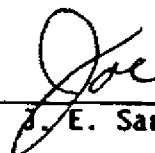
Your April 6, 1987 transmittal of the Task Group Meeting Minutes asked that I provide advice concerning the permanent home for the asbestos usage phaseout documents and standards. I agree with your Task Group's recommendation that the program reside within the CED sponsored TMS system. Recognizing that program statements and specifications for nonasbestos containing material will need to be addressed in several of the TMS Manuals⁽¹⁾, I recommend that suitable summary statements be included in all technology manuals that are impacted by the Asbestos Phaseout Program. The complete text of the C&P Asbestos Phaseout Program should be located in the Safety/Health Technology Manual - Section 8.

The approach outlined above will accomplish two key objectives. First, the asbestos phaseout is a wide ranging program affecting several skill areas and a variety of users. Maximum publicity of the phaseout rationale and approved substitute materials is essential to ensure consistency and to reduce confusion. Second, any changes to the agreed-to program, handling of variances, etc. should be consistent within the TMS program. Therefore, including reference to the Phaseout Program in the relevant TMS manuals will require that the responsible Manual Managers have U/A on all standard revisions.

(1) Safety/Health Technology
Valve/Piping Technology
Process Vessel Technology
Insulation Technology
Machinery Technology
Materials Technology
Others?

Mr. C. C. Neely
June 22, 1987
Page Two

Please let me know should you or the Task Group members have any question or need further dialogue.



J. E. Sanders

JES:csn
5008Y

UNION CARBIDE CORPORATION

Engineering, Manufacturing, and Technology Services
Central Engineering

P. O. Box 8361

So. Chas., WV 25303

BUSINESS CONFIDENTIAL

June 15, 1987

TO: L. E. Calvert
S. W. Clark
G. B. Elder
R. W. Engle
S. S. Murphree

COPY TO: E. M. Bartrug, Jr.
D. J. Dickson
P. D. Franson
G. E. Garrett
T. E. Martin
J. A. Reynolds
J. E. Sanders

FROM: C. C. Neely

SUBJECT: Background Data
Next Task Group Meeting
July 23, 1987

As mentioned in my May 18, 1987 transmittal to you, one of the agenda items for our July 23 meeting will be action plan development for asbestos-containing materials other than gaskets and packing that are used in the C&P work place. The attached listing published by the Alternative Materials Institute will hopefully provide a fairly complete listing by categories of the various products that we must consider in our action plan development. This will supplement the article entitled "Alternatives to Asbestos" that Larry recently submitted to us.

As discussed with some of you, I have arranged to have Karl Schmidt from the Cleveland GRAFOIL™ factory participate in our meeting and lead a discussion of the various GRAFOIL™ gasket products and their limitations. Karl is an Application Representative and should be able to help us factually address questions regarding the trade-offs associated with their various gasket products as a function of service conditions.

By copy of this memorandum, Messrs. Bartrug, Dickson, Garrett and Martin are requested to send a representative or representatives to this meeting to participate in the GRAFOIL™ gasket style trade-off discussions. The action plans that I hope will result from the discussions led by Karl Schmidt are ones relating to the use of GRAFOIL™ gaskets in:

Memo

- 2 -

June 15, 1987

- pumps and other commonly used machinery items; and
- control systems equipment.

As requested earlier, please transmit meeting agenda items to me by Monday, July 6.

Many thanks.



C. C. Neely

CCN:aa

Attachments

4917I



ALTERNATIVE MATERIALS INSTITUTE

AMERICAN SUPPLIERS OF NON-ASBESTOS PRODUCTS

December 17, 1986

NOTE

The attached list of questions and products was prepared by ICF, the contractor doing EPA's economic analysis related to the asbestos rulemaking. AMI is providing this list as a service to its members, but in doing so, AMI does not suggest that all of the information requested should be shared among the members of the Institute.

Some of ICF's questions relate to product prices, costs, market shares and the like. Although the information is needed by EPA, such data should not be shared among the members for antitrust reasons. We are currently developing mechanisms by which members may provide this information to EPA without sharing it with one another.

AMI018LQP

INFORMATION GAPS IN ICP WORK ON SUBSTITUTES

ASBESTOS PRODUCTS

Asbestos gasketing and packing

Handwritten: 100% at value applications market

SUBSTITUTES KNOWN BY ICP

Aramid
Flexible graphite
Glass
Cellulose
Blueguard
PTFE (100% at value applications market)
Carbon *graphite fibers*
Synthesseal (Armstrong)
Polybenzamidazole (PBI)
Mica

Asbestos drum brake linings

Semi-metallic (steelwool, iron and graphite producer)
NAO (non-asbestos organics)
- combination of Kevlar^R, fiberglass, and/or mineral fiber.

Brake blocks

Semi-metallics
NAO (non-asbestos organic)
combination of Kevlar^R, fiberglass, and/or mineral fiber

QUESTIONS

Are ceramic fibers used by packing and gasketing fabricators as a substitute for asbestos?
What are the projected market shares of substitutes for asbestos such as PTFE, flexible graphite, cellulose, carbon, glass, aramid, ceramic, PBI, Blueguard, and Synthesseal (Armstrong) in the packing and gasketing market?
What are the prices of the substitute products relative to the asbestos gasketing and packing?
What company(s) is/are the leader(s) in non-asbestos gasket formulation and technology?

What are the major substitute products and what are their major fibers (and perhaps fillers) for each major application?
What share of the OEM does each of the substitutes currently hold?
What might be the projected shares of the asbestos-based OEM that could switch to each of these substitute products?
What are the specific performance characteristics, service life, safety, and cost (process and materials) issues that justify these projections?
How much time will be needed to find acceptable substitutes in the OEM and aftermarket (allowing for development of materials, potential system redesigns, and testing)?
What are the prices of the major substitute products relative to the asbestos product?

For the four primary uses of brake blocks: trucks and three severe braking categories railroad cars, aircraft (e.g. jets) and off-road vehicles (e.g., logging and mining trucks), please answer all questions asked for drum brake linings.

ASBESTOS PRODUCTS

SUBSTITUTES KNOWN BY ICF

QUESTIONS

Full metallic (steel wool,
iron, other metal)

In addition:

Are there any other federal regulatory requirements
constraining the development of acceptable substitu-
tes in the OEM or aftermarket?

Friction materials
(industrial/commercial
machinery, excluding
on or off-road
vehicles)

NAO's (molded or woven)
(combination of Kevlar^R,
fiberglass, and/or mineral
fiber)

Please answer all the questions asked for drum
brake linings.

In addition:

Are there any other federal regulatory requirements
constraining the development of acceptable substitu-
tes in the OEM (or aftermarket)?

Clutch Facings
(manual transmissions)

NAO's (molded or woven)
(combination of Kevlar^R,
fiberglass and/or mineral
fiber)

Please answer all the questions asked for drum
brake linings and for friction materials.

In addition:

Mercedes-Benz and Saab-Scania stated in their
comments that they now use asbestos-free clutch
facings in their OEM vehicles; what are these
substitute products (major fibers and perhaps
fillers)?

Is it true that safety and performance considera-
tions for clutch facings are less than a problem for
vehicle and heavy machinery brake linings, and thus
the testing time for substitute clutch facings may
be shorter and simpler?

Disk brake pads
(light and medium
vehicle)

Semi-metallic

What is the purchase cost of the semi-metallic
substitute product relative to the cost of the
asbestos product?

Disk brake pads
(Heavy vehicles)

Semi-metallic

What is the purchase cost of the semi-metallic
substitute product relative to the cost of the
asbestos product?

Rollboard

Fiberfrax Paper (550 & 570)
Kao wool Rollboard
Ceramic paper

Is anyone producing or importing asbestos rollboard?

ASBESTOS PRODUCTS

Millboard

Mineral boards
Ceramic boards

Who are the importers and/or producers of asbestos millboard?

Pipeline Wrap

Mineral felt
Urethane foam
Fiberglass felt

What are the projected market shares for the three substitutes - mineral felt, fiberglass felt, and urethane foam? What is the useful life for each substitute and the asbestos felt?

Roofing Felt

Fiberglas felt
Organic felt
Single-ply membrane

What are the projected market shares for the three substitutes - fiberglass felt, organic felt and single ply membrane?

Flooring Felt

Fiberglas
Pulpex^R
Clay
Duracon^R
Bontex 148 R

Is anyone producing or importing asbestos flooring felt?

Vinyl asbestos floor tile

Pulpex^R
Santoweb^R
Microfibers^R
Fiberglass
Polyester

Is anyone producing or importing vinyl asbestos floor tile?

Missile Liner

Kevlar^R fiber
Ceramic fiber

What is the useful life of the following missile liners - rubber and asbestos rubber and Kevlar^R, ceramic and rubber?

Sealant-Tape

For building applications:
Ductmate
For automobile windshields:
Urethane

Who produces structural urethane used to seal automobile windshields?
How much does structural sealant tape cost (per linear foot preferably)?
Are there other substitutes?

Asbestos textiles

Fiberglass
Ceramic/Refractory silica
Carbon/graphite
Aramids

Are there other fibers that can be used in replacement products for asbestos textiles other than fiberglass, ceramic/refractory silica, carbon/graphite, aramid, and PBI?

QUESTIONS

ASBESTOS PRODUCTS

SUBSTITUTES KNOWN BY ICF

Polybenzimidazole (PBI)

QUESTIONS

What is the projected market share for each substitute fiber in the asbestos textile replacement market?

What is the density of each fiber relative to asbestos?

How much (by weight and/or volume) of each substitute fiber is used relative to asbestos?

What are the costs (\$/lb is preferable) of the finished substitute products relative to asbestos for major packing and gasket applications (e.g. 1/2 inch rope, 1/8 inch cloth).

Asbestos-cement pipe

PVC

Ductile Iron

Reinforced Concrete

Prestressed Concrete
(pretensioned)

What are the average prices for PVC, ductile iron, prestressed concrete, and reinforced concrete pipe?

How do these prices compare with the cost of A/C pipe (e.g. 2x's, 3.5x's)?

Has pretensioned pipe largely replaced prestressed concrete pipe?

Would PVC be the major substitute in the 0-150 psi, 4"-12" diameter pressure pipe market and the 0'-16', 4"-24" diameter non-pressure market?

Would ductile iron be the major substitute in the 150 psi, 4"-12" diameter f, the less than or equal to 150 psi, 12"-24" diameter pressure pipe market and the greater than or equal to 16' deep, 4"-24" diameter non-pressure market?

Would prestressed concrete (or pretensioned) pipe be the major substitute in the greater than 24" diameter pressure pipe-market?

Would reinforced concrete pipe be the major substitute in the greater than 24" diameter non pressure pipe market?

Do these projected market shares for A/C pipe replacement market appear correct?

	by linear foot	by weight
PVC	72%	40.5%
Ductile Iron	23.7%	37%
Prestressed concrete	4%	22%
Reinforced concrete	less than .5%	.5%

ASBESTOS PRODUCTS

Corrugated asbestos-cement sheet

Flat asbestos-cement sheet

high temp. & electrical

Roof Coatings & Cements

SUBSTITUTES KNOWN BY ICF

Fiberglass reinforced plastic (FRP)
PVC

Aluminum
Galvanized steel
Glass reinforced cement sheet

Transite II, Flexboard II, Marinite (Manville) Minerit (Sanspray; Santa Clara, CA) Eterboard, Eplex (Etermit; Reading, PA) Ultraboard (Weyerhaeuser; Tacoma, WA) Latticecrete EP cement board (Latticecrete; Bethany, CT) Durock (US Gypsum) Wonderboard (Modulars; Hamilton, OH) Benelex 402 (Masonite; Laurel, MS)

Fiberglass reinforced polyester (GPO) (Glastic; Cleveland, OH)

Glass reinforced cement (GRC) or Sterling Board Zircar Refractory Sheet (Zircar, Florida, NY)

For laboratory table tops: Epoxy resin
Impregnated sandstone
Colorlith II
Laminated plastic

Cellulose Fibers
Polyethylene Fibers
Clay, Talc

QUESTIONS

What are the major substitutes other than FRP, PVC, aluminum and galvanized steel? Is glass reinforced cement sheet?

What are the projected shares of the replacement market each substitute will take?

What corrugated sheets can be used in waterway or bulkhead construction?

What are the major substitutes for building/construction applications? high temperature applications? electrical applications?

Are all the products mentioned to the left potential substitutes?

What is the projected market share of the A/C sheet replacement market for each substitute?

What are the installation costs for each substitute relative to those for flat A/C sheet?

What is the useful life of each substitute relative to the life of A/C sheet?

What percentage of the roof coatings or cement market is asbestos-free?

Are there other substitutes being used?

ASBESTOS PRODUCTS

Non-Roofing (specialty)
Adhesives, Sealants
Coatings

SUBSTITUTES KNOWN BY ICP

Polyolefins
Aramid
Cellulose
Fumed Silica
Clay, Talc, Limestone

QUESTIONS

What other substitute fibers & fillers are being used
in specialty formulations?
What are the differences between silica fibers,
fumed silica, and sodium silicates?



I N T E R N A L C O R R E S P O N D E N C E

Engineering, Manufacturing, and Technology Services
Central Engineering
Technical Center

Post Office Box 8361
Building 2000
South Charleston, WV 25303

February 19, 1987

TO: Mr. B. G. Perry

COPY TO: Mr. P. D. Franson
Mr. W. G. Lilly, Jr.
Mr. C. C. Neely
Mr. S. W. Turicchi

SUBJECT: Asbestos Usage

Bob:

We are proceeding to establish plans to implement the phase-out of asbestos-containing materials from C&P facilities. I have asked Clyde Neely to lead this effort which will require resources and input from Maintenance groups, Purchasing, Safety and Health as well as Engineering Technology skill centers. Clyde will, in the next couple of weeks, develop a plan outlining the general steps required for this program between now and January 1989. We'll keep you posted on progress.

Very truly yours,

J. E. Sanders

JES:he
4898Y(4)

UNION CARBIDE CORPORATION
ENGINEERING, MANUFACTURING, AND TECHNOLOGY SERVICES
Central Engineering
South Charleston, West Virginia

UCC BUSINESS CONFIDENTIAL
June 22, 1987

TO: C. C. Neely

COPY: L. E. Calvert
S. W. Clark
G. B. Elder
R. W. Engle
P. D. Franson
W. G. Lilly
S. S. Murphree

FROM: J. E. Sanders

SUBJECT: Phaseout of Asbestos Containing Materials

Clyde:

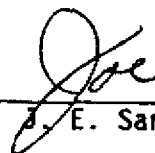
Your April 6, 1987 transmittal of the Task Group Meeting Minutes asked that I provide advice concerning the permanent home for the asbestos usage phaseout documents and standards. I agree with your Task Group's recommendation that the program reside within the CED sponsored TMS system. Recognizing that program statements and specifications for nonasbestos containing material will need to be addressed in several of the TMS Manuals⁽¹⁾, I recommend that suitable summary statements be included in all technology manuals that are impacted by the Asbestos Phaseout Program. The complete text of the C&P Asbestos Phaseout Program should be located in the Safety/Health Technology Manual - Section 8.

The approach outlined above will accomplish two key objectives. First, the asbestos phaseout is a wide ranging program affecting several skill areas and a variety of users. Maximum publicity of the phaseout rationale and approved substitute materials is essential to ensure consistency and to reduce confusion. Second, any changes to the agreed-to program, handling of variances, etc. should be consistent within the TMS program. Therefore, including reference to the Phaseout Program in the relevant TMS manuals will require that the responsible Manual Managers have U/A on all standard revisions.

(1) Safety/Health Technology
Valve/Piping Technology
Process Vessel Technology
Insulation Technology
Machinery Technology
Materials Technology
Others?

Mr. C. C. Neely
June 22, 1987
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Please let me know should you or the Task Group members have any question or need further dialogue.



J. E. Sanders

JES:csn
500BY