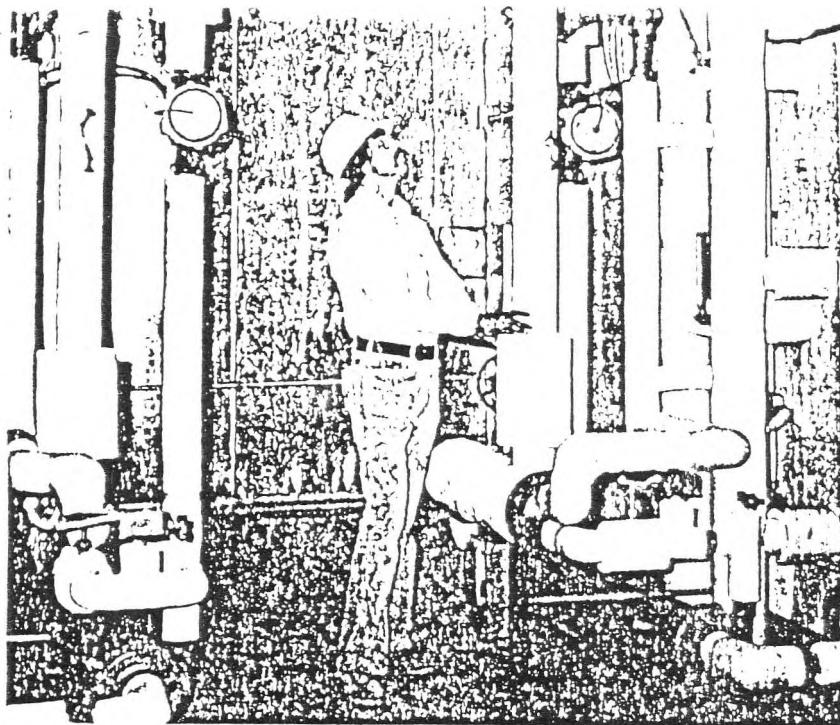


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Eliminating Asbestos In A GLASS PLANT

A project to establish goals and procedures for identification, removal, disposition, and substitution of asbestos-laden materials

cc:
→ J.F. Reiss 1-03

By JAMES C. HANEY
PPG Industries, Inc.
Pittsburgh, Pa

C. J. Huber
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A Glass Problems Conference Presentation

ASBESTOS is a broad term embracing a number of fibrous mineral silicates that differ in chemical composition. However, for this presentation, I will refer only to the broad definition of asbestos.

The current Occupational Safety and Health Administration permissible exposure limit for airborne concentrations of asbestos fibers is two fibers per cubic centimeter, and new limits of 0.5 fibers per cubic centimeter and 0.1 fibers per cubic centimeter have been proposed.

It has become desirable to remove asbestos from our glass-making operations. In fact, our top management is committed to the policy, stated as follows: "Consider Asbestos No Longer Available."

By accepting this policy, it means, at

least in the beginning, that you must be willing to accept a lower efficiency of operation. Some replacement materials will not perform as well in a hot environment, and their costs will most likely be higher.

Having obtained top management's commitment to eliminate asbestos from our glass plant, how do we accomplish our goal? We must first identify all components in the plant that contain asbestos fibers, find a substitute material, properly dispose of the used asbestos parts, and then establish a procedure that will prevent new asbestos from entering the plant.

Our first step of identification was to organize a group of knowledgeable technicians. An Asbestos Replacement Committee (ARC) was formed with an experienced representative from each

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File: Substitutes

of our seven primary glass plants. Equally talented members were selected from central engineering, research, environmental affairs, and supply. A plant manager with previous experience as a tank superintendent was selected to chair this important committee.

Each ARC member developed a list of asbestos components being used in his home plant. These lists were then shared at the next committee meeting. This procedure was continued until all plants considered their lists as being all inclusive.

A summary of the lists is shown below:

ASBESTOS MATERIAL LISTING

ROLLS

1. Lehr rolls and spares
2. Tempering rolls and spares
3. Cooling conveyor donuts
4. Tempering quench donuts

INSULATION

1. Float bath heat shields
2. Lehr curtains
3. Tank insulation
4. Millboard—for heat shields
5. Heat shield curtains
6. Ventilator shields
7. Marinite insulation
8. Regenerator insulation
9. Primary and secondary paving
10. Flue and generator chamber insulation
11. Float bath roof blocks
12. Port insulation
13. Milluse water hoses
14. Asbestos covered hoses
15. Insulated hoses
16. Asbestos sheathing
17. Air-conditioning equipment
18. Cooler heat shields
19. Burner heat shields
20. Burner covers
21. Fire wall curtains
22. Float bath tin drain pockets
23. Tempering quench shields
24. Ductwork coverings
25. Millboard, boiler and walls
26. Water and steam line insulation
27. Camera enclosures

SAFETY EQUIPMENT

1. Asbestos gloves
2. Aluminized asbestos coats, pants, and boots
3. Hot suits and gloves

ELECTRICAL

1. Thermocouple insulation
2. Thermocouple lead wire
3. Wire insulation

4. Coats or shields on electrical magnetics
5. Main electrical feeder cables
6. Sindanyo board for bus bar packing gland
7. Sindanyo board for cable spacers
8. Sindanyo board for radiamatic block top plate
9. Sindanyo board for element block top plate
10. Electrical barriers and separators in switches and starters

SEALS AND GASKETS

1. Tempering hearth block seals
2. Steam valve gaskets
3. Internal combustion engine gaskets
4. Pump gaskets and packing
5. Boiler seals
6. Boiler manhole gaskets
7. Boiler handhold gaskets
8. Gas valve seals

BRAKES

1. Over-the-road vehicle brake lining
2. Industrial vehicle brake lining
3. Friction discs on chain pulls
4. Elevator brakes
5. Overhead door operator brakes

MISCELLANEOUS

1. Swivel and equipment couplings
2. Ceiling tile
3. Laboratory tools in quality control lab
4. Drying oven in lab
5. Wire-impregnated asbestos cloth
6. Plain asbestos cloth
7. Asbestos paper
8. Asbestos rope
9. Asbestos furnace cement
10. Asbestos tape
11. Asbestos sleeving
12. Asbestos mats
13. Asbestos roof material
14. Building material—transite
15. Floor tile

Having identified this asbestos material in the plant, the big job now was to find a reasonable substitute. Again, each member of the committee contributed available information from his group. Different plants were assigned to find substitutes for specific materials or components. The resultant list is shown in the accompanying table. The list does not represent approval or disapproval of the many products listed, nor is it a warranty or guarantee concerning any of the products. It simply represents our experience.

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ASBESTOS SUBSTITUTE MATERIALS

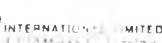
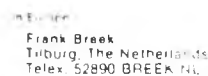
Material Use	Asbestos Product	Substitute
BLOCK (HI-TEMP)	ASBESTOS BOARD	SYNTHANE G-#HT PYROTEK NICOLET
BUILDING PANELS	TRANSITE	METAL FIBER GLASS THERMOFLAKE W/O ASBESTOS
CEMENT—HI-TEMP	THERMOFLAKE W/ASBESTOS	INDUSTRIAL WASTE REMOVAL CO.
CLEANING SERVICES		THERMOBEST FREYPEL ZETEX KEVLAR NEXTEL
CLOTHING— REFLECTIVE	ASBESTOS INSULATED	NEXTEL 312 (3M) TUF-TEMP REFRASIL ZETEX PBI
CURTAINS—FURNACE & LEHR	ASBESTOS CLOTH	REFRASIL SH-TEMP ZETEX
CURTAINS—HI-HEAT	ASBESTOS CLOTH	GATNE #396 SCAN-PAC #RF12 SYNTHANE #G7 FUSED SILICA ROCKBESTOS W/FIBER GLASS FIBER GLASS
DONUTS— HI-TEMPERATURE	BRAKE MATERIAL	
ELECTRIC CABLE (HI-TEMP)	ROCKBESTOS (ASBESTOS)	
FAN BOOTS (HI-TEMP)	ASBESTOS	
FLOOR TILE	ASBESTOS TILE	VINYL TILE WOOD CARPET CERAMIC SCAN-PAC CARLISLE CORP. KEVLAR ZETEX NOMEX COVER STAINLESS BRAID MARINITE NI FIBERFRAX GRC NU BOARD MARINITE PYROTEK (GRAPHITED #370) (CARBON YARN) TEFLON
FRICTION MATERIAL	BRAKE LINING	NEW HUDSON B&W 823 TREATED PYROTHERM-U-1 FUSED SILICA GRAPHITE ORGANICS FIBER GLASS PVC
GLOVES—ASBESTOS	ASBESTOS CLOTH	FIBERFRAX NEXTEL 312 (3M) REFRASIL YARN TEFLON COATED AMERICAN CLEANING FIBER GLASS COVER
HOSE—HOT WATER	ASBESTOS COVERED	
INSULATION BOARD	MIL LBOARD	
MANHOLE GASKETS	ASBESTOS	
PACKING—PUMP, ETC.	ASBESTOS GRAPHITE	
ROLLS DISC— HI-TEMPERATURE	NICOLET 405	
ROLLERS—(HI-TEMP)	ASBESTOS FILLED	
ROOFING FELT	ASBESTOS	
ROPE—ASBESTOS SLEEVING	INSULATION ASBESTOS CLOTH	
THERMOCOUPLES	ASBESTOS INSULATED	
VACUUM CLEANERS	CLEANING	
WIRE—HI-TEMP ELECTRICAL	ASBESTOS COVERED	

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Some of these substitute materials were relatively easy to find, test, and place into service. Some replacement items have been extremely difficult to find. When an inquiry is sent to a potential equipment manufacturer, he is requested to certify that no asbestos is used in the manufacture of that equipment. If asbestos is used, he is requested to state its form and its use. This is one method to help control the amount of asbestos that enters your plant.

Having found a substitute, the problem is how to dispose of the old material. The disposal of all material containing asbestos must be accomplished under the standards as established by OSHA and EPA. Some of the requirements are as follows:

- All material must be collected and placed in impermeable containers and sealed.
- Containers must be appropriately labeled and buried in an approved land fill.
- Personal protective equipment includes: single use air-purifying respirator, single use disposable clothing, a separate room to change clothing.

Most asbestos removals are simplified by first soaking the material with water and then placing in a plastic bag or removing with a strong vacuum system.

The important point here is that there are requirements to be followed when removing and disposing of asbestos-containing material to prevent unsafe exposure limits during handling and for years to come.

PPG is very proud of its accomplishment in reducing the use of asbestos in our plants. We will continue the efforts of our group.

Asbestos has been an answer to difficult problems in high-temperature work for many years. It has often been the predominant material considered. We are not suggesting, though, that it has always been a perfect answer. Our hope is we will find other materials that will do as well, perhaps better.

Early substitution efforts usually result in increased costs. We must accept some higher costs to obtain a better environment for our employees.

Private industry contends that it can police itself. Perhaps this is an opportunity to demonstrate our ability and desire to correct old problems and eliminate potential health hazards on our own initiative. Our employees are the greatest assets we have. ■