PLAINTIFF'S EXHIBIT
ECC-19

Additional copies of this pamphlet and informational materials listed below are available from the Asbestos Information Association/North America:

- "What You Should Know About Asbestos and Health" — an employee information pamphlet.
- Recommended Work Practices
  - — Fabrication and Use of Asbestos Paper Products
  - — Shop and Field Fabrication of Asbestos Sheet Products
  - — Molding and Fabrication of Asbestos Containing Plastic Products
  - — Fabrication and Use of Asbestos Friction Materials
  - — Use and Handling of Asbestos Textile Products
- "Federal Regulations — Asbestos" — a comprehensive handbook of regulations issued by Federal regulatory agencies.
- "Asbestos in the Atmosphere — A hazard to health"? — a general information pamphlet.
- "Asbestos in Water — A hazard to health"? — a general information pamphlet.
- Poster Series — Asbestos Health Hints for the Workplace — 15" x 23"
  - — Vacuum dust spills . . . never dry sweep!
  - — When required, always use your respirator!
  - — If you don't smoke now, don't start. If you do smoke, quit!
  - — Report unsafe conditions immediately!
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  - — Use change rooms and lockers! Leave dusty clothes at work!
- Poster — Recommended Practices for Handling Asbestos Fiber — 11" x 14"

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1835 K Street, N.W.
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Recommended Practices for Handling Asbestos Fiber

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Recommended Practices for

Handling Asbestos Fiber

Protection from fire, absorption of heat from friction, high tensile strength as a reinforcing material, resistance to corrosion and insulation from heat, cold and noise are among the properties of asbestos that result in its use in hundreds of industrial applications and home products.

Asbestos is the name given to a group of hydrated silicate minerals that are characterized by fibrous crystallization. Though asbestos is fairly common to the earth's crust, not all deposits are of commercial value. Because asbestos is fibrous and, in a certain range of sizes, can enter the lungs, maximum care should be taken to avoid exposure to asbestos dust and the hazards to health that can result.

GENERAL PRECAUTIONS

In all stages of handling — packaging, transporting, unloading, storing, and in-part moving —asbestos fiber bags should be handled carefully and in such a manner as to prevent damage of bags and the generation of dust.

Damaged bags should be immediately repaired, resealed or put into closed receptacles. Any spillage of asbestos fiber should be cleaned up immediately — either by vacuum equipment or, after thoroughly wetting, by sweeping — and should be deposited in suitable closed receptacles.

Consult and observe OSHA regulations governing asbestos in the workplace; EPA rules on discharge to the ambient air; and other local codes, rules or regulations controlling the handling and use of asbestos fiber.

UNLOADING

Unitized loads should be lifted intact to and from holds of ships, and off and on land transport by forklift trucks or other suitable handling equipment.

Care should be taken to avoid puncturing the asbestos fiber bags during unloading from ships, railroad cars, trucks or other modes of transportation. Hooks or other sharp instruments should not be used. Loose fiber accumulated during transit should be picked up by vacuum cleaner before unloading.

STORAGE

For storage, fiber bags should be stacked and moved with care to avoid breakage; protected from puncture by moving vehicles; and, if possible, should be isolated from traffic in the warehouse and covered to prevent dust generation. To prevent deterioration of stored bags, the principle of first-in, first-out should be followed.

HANDLING

Maximum possible enclosure and fully effective dust control systems should be provided at all stages of in-plant handling where dust is created, such as in bag opening, fiber dumping and bag disposal operations. Loose fiber should be cleaned from work areas by vacuum cleaner, or after thoroughly wetting, by sweeping, and then deposited in covered receptacles.

PROTECTIVE EQUIPMENT

Wearing of respiratory equipment approved for protection against asbestos dust should be required at all stages of asbestos fiber handling where quantities of dust are generated which cannot be kept within the permissible exposure limits by dust control equipment or other methods.

TRANSPORT

Where the use of asbestos requires the transport of loose fiber in open carts or buggies, covers should be used to prevent spilling and dust generation.

WASTE MATERIALS

Waste materials, such as collected dust and empty fiber bags, should be placed in special closed receptacles and disposed of in such a manner as to prevent the release of dust. Safety practices outlined above in the ***HANDLING*** and ***PROTECTIVE EQUIPMENT*** sections should be followed during these operations.

All dust from exhaust systems should be collected and safely disposed of, being careful not to release dust into the outside air. Particular attention should be paid to the protection of employees whose job it is to dispose of collected dust from fabric filter dust collection and similar cleaning operations.

table drugs filtered through asbestos filters.

A measurement of the normal "background" level of asbestos fibers provides a means of comparing the levels in beverages, and drugs filtered through asbestos containing filter pads. Studies in the United States and abroad have consistently shown that the asbestos content of various soft drinks, beers, wines, and parenteral drugs is no more than and, in many cases, less than the natural background level of asbestos detected in water.[12 13]

Preliminary results of a 1973 survey made for the Food and Drug Administration showed that the use of asbestos-containing filters bears no relationship to the presence of asbestos fibers in the finished product.[14] Thus, it is unlikely that the elimination of asbestos filters in the production of parenteral drugs will result in any reduction in asbestos content of the finished product.

Governmental Action

The Environmental Protection Agency has promulgated national waste water effluent standards for asbestos manufacturing operations to control the potential discharge of asbestos-bearing waste into our nation's waterways and publicly owned treatment works. The asbestos manufacturing industry in the United States participated in the development of these regulations.

In March 1975, the Food and Drug Administration published a regulation restricting the utilization of asbestos filters in the manufacture, processing or packaging of components of drug products for parenteral injection in humans. At the same time, however, FDA reaffirmed a previous decision made in September 1973 that "promulgation of regulations on the limitations or prohibition of the use of asbestos filters for the preparation of foods and non-parenteral drugs . . . is unwarranted until more reliable data can be obtained concerning these matters."[15]

SUMMARY

1. Asbestos exists naturally in small though detectable amounts in certain rock formations throughout the world and for millions of years has been released into the environment through erosion by wind and water.

2. The Advisory Committee on Asbestos Cancers of the International Agency for Research on Cancer has stated that evidence does not indicate a risk of cancer resulting from asbestos fibers present in water, beverages, food or fluids used in the administration of drugs. Levels of asbestos found in beverages, drugs, etc., have not been demonstrated to be hazardous to human health.

3. The evidence for a relationship between heavy occupational asbestos inhalation and increased risk of gastrointestinal cancer is inconclusive.

4. There is no existing evidence of a relationship between gastrointestinal cancer and drinking water carried through asbestos-cement pipe.

5. The asbestos content of various soft drinks, beer, wines and parenteral drugs filtered through asbestos containing filter pads is no more than and in many cases less than the natural background level of asbestos that may be found in the world's water sources.

REFERENCES

1. "Report of the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer," *British Journal of Ind. Medicine*, Vol. 30, pp. 180-186, 1973.
2. "Report on Research at St. James' Hospital, Leeds, England" by L.M. Swinburne, Appendix 4, including report from Asbestos Research Council, October 1970-October 1971.
3. "Cancer Risk of Insulation Workers in the United States," a paper by I.J. Selikoff and E.C. Hammond presented at IARC Conference on the Biological Effects of Asbestos, Lyon, France, 1972.
4. "Feeding of Blue Asbestos to Rats" by F.M. Bonser and D.B. Clayton, 1967, Annual Report, British Empire Cancer Campaign for Research, p. 242.

possible health hazard of drinking water conveyed through these pipes.

It can be assumed that, if there is a relationship between gastrointestinal cancer and use of asbestos-cement pipe, there would be an increase in the cancer rate as use of the pipe has increased. U.S. Public Health Service records show, however, that incidence of GI cancer in the United States has steadily declined though the usage of asbestos-cement pipe has risen significantly.[7]

In a study of drinking water in nine cities that used asbestos-cement pipe for periods ranging from 8 to 17 years, not one of the water samples, either before or after passing through the asbestos-cement pipe, contained fibers that were visible under a light microscope. The highest asbestos content found in this study was 6 micrograms per gallon, about one five-millionth of an ounce. This means that if a man were to drink eight glasses of water a day he might swallow a total of twenty-seven ten-thousandths of an ounce (.0027) of asbestos in a lifetime of 70 years.[8,9]

A special committee of asbestos-health experts convened by The American Water Works Association Research Foundation reviewed all available data and concluded that the "risk to health from the use of (asbestos-cement water pipe) systems is small—approaching zero."[10]

Reserve Mining Case

Perhaps the most widely publicized alleged health hazard from asbestos in water is the case of the Environmental Protection Agency vs. Reserve Mining Company. The case, involving the disposal of waste taconite tailings into Lake Superior, became a health issue when it was claimed that the tailings contained cummingtonite, said to be a form of asbestos.

Many experts were called for testimony during the proceedings. The court appointed witness, Arnold L. Brown, M.D., Chairman of the Department of Pathology and Anatomy, Mayo Clinic, Rochester, Minnesota, stated that there is no evidence of an excess of cancer in Duluth, Silver Bay, or other North Shore communities and further testified: "Scientifically and medically I see no evidence for an increased incidence of cancer in those communities that could be attributed to the presence of asbestos fibers in air or water."[10]

Early in the trial, the court ordered an extensive study of tissues from deceased persons in the Duluth area to determine the presence of asbestos fibers. The study failed to disclose any asbestiform fibers which could have come from Reserve during the lifetimes of the subjects. The subjects had been selected by Court witnesses as representatives. Only tissues from persons inhaling Duluth air and ingesting Duluth water in excess of 15 years were examined.[10]

In a summary of medical testimony, before the Eighth Circuit Court of Appeals, it was stated: "There is no evidence that ingestion of asbestos in any amount has ever caused disease in anyone. Thus, there is no evidence that Reserve's discharge into Lake Superior (whether or not such discharge contains any asbestos) constitutes a present or future likelihood of disease."[11]

In March 1975, the Court in its final ruling ordered the company to comply with all air and water discharge regulations, but noted, "the evidence is insufficient to support the kind of demonstrable danger to the public health that would justify the immediate closing" of the facility.

Asbestos Filters

Minute amounts of fiber in some beverages and parenteral (injectable) drugs filtered through asbestos-containing filters have also been detected. It is difficult to determine whether the minute asbestos fibers in some liquids come from the filter or are already in the water. There is evidence that asbestos filters remove asbestos material along with other particulates.

Asbestos-containing filters have been in worldwide use for many years. It is reasonable to inquire if beverages or food containing electron microscope-size mineral fibers, including asbestos, might expose large populations to a potential health hazard. Numerous studies have shown that, despite their long-term use, there is no evidence that anyone has ever contracted gastrointestinal cancer or mesothelioma from beverages or injec-

Introduction

Water supplies in various sections of the world contain infinitesimal amounts of asbestos fiber, along with other particulate matter. The fibers come primarily from natural sources, and secondly from man's activities, including the mining and milling of asbestos-bearing rock and the manufacture, use, and disposal of some asbestos-containing materials.

Inhalation of excessive quantities of airborne asbestos fiber in occupational settings is known to increase the risk of respiratory disease and certain types of cancer among industrial workers. There is also an indication of an increased incidence of gastrointestinal (GI) cancer among these workers. This has led to speculation as to whether the general public is subject to a health risk from the small amounts of asbestos fiber that may be found occasionally in water. In its report issued in 1973, the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer, a division of the World Health Organization, stated that no evidence exists which would support the existence of an increased risk of cancer resulting from asbestos fibers present in water, beverages, food or in the fluids used in the administration of drugs.[1]

Since the discovery of the risk to health from uncontrolled fiber, the asbestos industry has committed itself to the safe handling of the remarkable mineral in the workplace and to control its operations to eliminate the release of free fibers into the environment. A separate AIA/NA pamphlet discusses asbestos in air. This pamphlet is addressed to the issue of asbestos in water.

Asbestos Serves the World

Asbestos, used since antiquity, has widespread and important applications in our modern technological society. Because of its remarkable resistance to fire, heat, friction, and corrosion, approximately 3,000 different products containing asbestos, ranging from pot holders to brake linings, from asbestos-cement pipe and building materials to packing and gaskets are in daily use throughout the world. In the vast majority of these products, the asbestos is "locked-in" with cement, resins, or other binders which restrict fiber release during normal handling or use. In 1974, nearly 850,000 tons of asbestos, primarily chrysotile from Canada, was used in the United States. Worldwide production is about 5 million tons.

GI Cancer and Asbestos Exposure

Both human evidence and animal experimentation regarding a possible relationship between excessive asbestos exposure and an increased risk of gastrointestinal cancer is scanty and contradictory.[2] Some researchers have reported higher-than-normal rates of GI cancer among industry groups heavily exposed to airborne asbestos.[3] Several major animal feeding experiments, however, produced no tumors in the GI tracts of the animals, even though the amounts of fiber fed to the animals were massive when compared with human occupational exposures known to result in respiratory disease.[4]

While some injection experiments have produced site and mesothelial tumors in test animals, the amount of fiber used in each case was so large as to render any attempted translation to human experience inappropriate. The studies strongly suggest that development of cancers in test animals is directly related to dose and, even more importantly, to the size of the fiber used in the experiment. Electron microscope-sized fibers (less than 5 microns in length) did not produce tumors in test animals.[5]

Medical opinion on the subject of gastrointestinal cancer and heavy occupational exposure is divided. Some experts consider the evidence inconclusive while others believe that only a "small risk" may exist. [6]

Asbestos-Cement Pipe

Asbestos-cement pipe has been used to convey potable water for more than half a century in North America, Europe and other parts of the world. The question has been raised as to the

5. "The Locus of Pathogenicity of Asbestos Dust" by P. Gross, Archives of Environmental Health, Vol. 27, p. 240, 1973.
6. "Asbestos: The Need for and Feasibility of Air Pollution Controls," National Academy of Sciences, Committee on Biologic Effects of Atmospheric Pollutants, ISBN 0-309-01927-3, 1971.
7. "Asbestos-Cement Water Pipe and Health" A/C Pipe Producers Association, Washington, D.C., p. 4, 1973.
8. "A Study of the Problem of Asbestos in Water," The American Water Works Research Foundation, *American Water Works Association Journal*, Sept. 1974, p. 5.
9. "Asbestos-Cement Water Pipe and Health," A/C Pipe Producers Association, Washington, D.C., p. 3, 1973.
10. From testimony by Dr. Arnold Brown in Federal District Court as quoted in *Congressional Record*, Jan. 29, 1975, p. S1179.
11. From testimony in Federal District Court as quoted in *Congressional Record*, Jan. 29, 1975, P. S1180.
12. "Asbestos Fibers in Beverages and Drinking Water," by A.M. Cunningham and R. Pontefract, Nature, Vol. 232, p. 332-333, 1971.
13. Report to Food and Drug Administration by Mr. Philip McGrath, July 10, 1973.
14. Report to the Acting Director, Bureau of Drugs by Dr. J. Richard Crout, 1973.
15. *Federal Register*, March 14, 1975, p. 11867.

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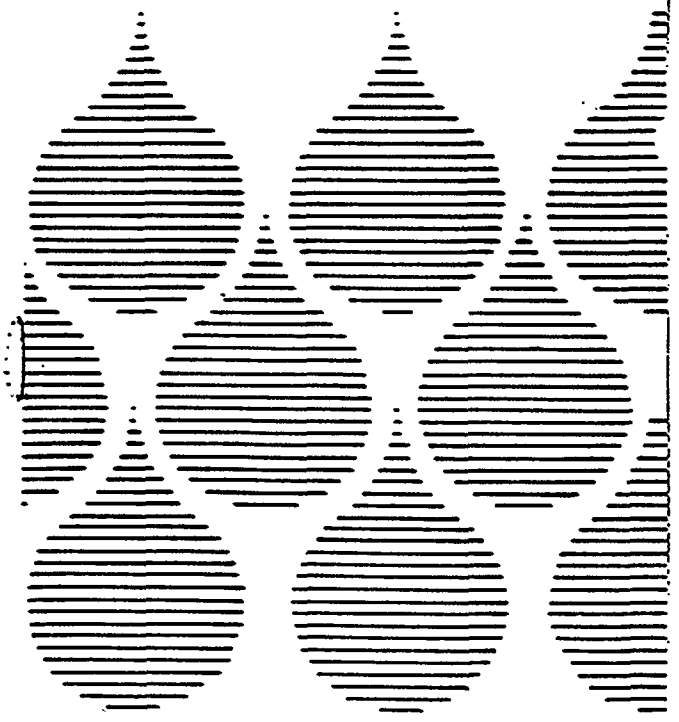
Asbestos in Water

A hazard to health?



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2. Biological Effects of Asbestos. Report of the Advisory Committee on Asbestos Cancers to The Director of the International Agency for Research on Cancer, World Health Organization, IARC Scientific Publications No. 8, pp. 341-346, 1973.
3. "Asbestos Cancer: Past and Future Hazards" by J. C. Gilson. Proceedings of the Royal Society of Medicine, Vol. 66, pp. 395-403, 1973.
4. "Epidemiologic Surveillance of Mesothelioma in Canada" by A. D. McDonald and J. C. McDonald. CMA Journal, Vol. 109, pp. 359-362, 1973.
5. Background Information On Development Of National Emission Standards For Hazardous Air Pollutants: Asbestos, Beryllium, And Mercury. Environmental Protection Agency, EPA-APTD-1503, pp. 22-23, March 1973.
6. "Standard For Exposure to Asbestos Dust." Federal Register, Vol. 37, No. 110, pp. 11318-11322, June 7, 1972.

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Asbestos in the Atmosphere

A hazard to health?

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Small amou...of asbestos fiber can be detected in the atmosphere in many areas of the world. The fibers come primarily from natural sources and secondarily from the mining and milling of asbestos-bearing rock and the manufacture, application, use, removal, and disposal of some asbestos containing products. There is no evidence that these tiny amounts of asbestos in the ambient air are a danger to human health.[1,2] Nevertheless, the asbestos industry is constantly improving its control of emission sources as part of a worldwide commitment to reduce environmental contamination.

Asbestos Serves the World

Asbestos, used since antiquity, has widespread and important applications in our modern technological society. Because of its remarkable resistance to fire, heat, friction, and corrosion, approximately 3,000 different products containing asbestos, ranging from pot holders to brake linings, from asbestos cement pipe and building materials to packings and gaskets are in daily use throughout the world. In the vast majority of these products, the asbestos is "locked-in" with cement, resins, or other binders which restrict fiber release during normal handling or use, except in machining operations. In 1974, nearly 850,000 tons of asbestos, primarily chrysotile asbestos from Canada, was used in the United States. Worldwide production is about 5 million tons.

Health Questions Arose

In the mid-sixties, questions were raised about the possible health effects of asbestos fibers in the atmosphere. By this time, it had been established that the inhalation of excessive quantities of asbestos fiber in occupational settings could lead to an increased risk of respiratory disease and cancer among industrial workers. Speculation about a possible public risk was heightened by (1) repeated findings of small amounts of asbestos fiber (among other particulate matter) in the lungs of city dwellers not known to have had occupational exposure to asbestos, and (2) the discovery of a small number of cases of mesothelioma, a rare form of cancer linked to asbestos exposure, among people living in the immediate vicini... of uncontrolled asbestos sources. A few cases were found among the families of industrial employees who brought substantial quantities of fiber into their homes on their clothes and in their hair. These findings prompted numerous scientific investigations to determine the extent, if any, of the problem of non-occupational exposure.

No Risk to General Public

In 1971, the National Academy of Sciences asked a panel of seven asbestos-health experts to review the available evidence on asbestos in the ambient air. In their report, the experts concluded:

"There is no evidence that the small numbers of fibers found in most members of the general population affect health or longevity."[1]

A similar conclusion was reached in a recent report of an Advisory Committee on Asbestos Cancers of the International Agency for Research on Cancer, a division of the World Health Organization. The report stated that at present, there is no evidence of lung damage from fibrosis by the low levels of asbestos exposure encountered by the general public in urban areas. Further, the report stated, with regard to mesothelioma: *"There is no evidence of risk to the general public at present."*[2]

Many Questions Answered

Among the more important facts upon which these conclusions were based are the following:

1. Asbestos exists naturally in small, though detectable, amounts in serpentine rock formations throughout the world and is constantly being released into the atmosphere through erosion by wind and water, and has been for millions of years.[1]
2. Ambient concentrations of asbestos, even in urban settings, are many times lower than levels known to result in no excess in disease among occupationally exposed populations.[2]
3. No evidence has been found linking the presence of asbestos fibers in the lungs of the general public with an increase in disease, or with the cause of death of those whose lungs were examined.[1]
4. Because of the long latency period of mesothelioma (30 years or longer), "neighborhood" cases being reported today result from conditions existing decades ago.[3] Today, modern dust control systems effect... / prevent the emission of significant amounts of asbestos into the atmosphere from mining, milling, and manufacturing operations.
5. No cases of mesothelioma, except for those exposed occupationally or domestically to fiber-laden worker clothing, have yet been discovered within a 20-mile radius of the chrysotile asbestos mines and mills of Quebec, even though emissions in the past were probably heavy by today's standards.[4] Chrysotile asbestos accounts for approximately 97 percent of the asbestos used in the United States today.

Government-Industry Actions

Despite these findings, both government and industry have sought ways to further reduce the amount of asbestos in the air. In April 1973, the U. S. Environmental Protection Agency (EPA) promulgated national emission standards for asbestos to assure that atmospheric concentrations could not increase to potentially hazardous levels in the future. In its justification document, EPA stated: *". . . the available evidence does not indicate that levels of asbestos in most community air cause asbestotic disease . . ."* and *". . . in order to provide an ample margin of safety to protect the public health from asbestos, it is necessary to control emissions from major man-made sources of asbestos emissions into the atmosphere, but that it is not necessary to prohibit all emissions...."*[5]

Among its major provisions, the EPA standard banned the spraying of asbestos-containing fireproofing in high-rise construction, known to be a dusty operation.

The U.S. Occupational Safety and Health Administration, in June 1972, promulgated occupational standards for exposure to asbestos dust in the workplace. Among the OSHA provisions is one designed to prevent employees from carrying asbestos fiber home in their clothes.[6] To implement this provision, the asbestos industry provides change rooms, lockers, shower facilities, and, in some cases, disposable coveralls and headgear for employees where necessary.

Dust, which can result from the processing of asbestos, can be controlled. The asbestos industry is dedicated to the safe handling of the remarkable mineral in the workplace and to c...l of the emission of asbestos fibers into the at...ere.

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Pamphlets—"Asbestos in the Atmosphere—A hazard to health?"
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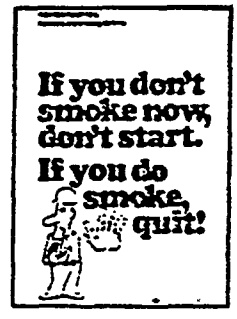

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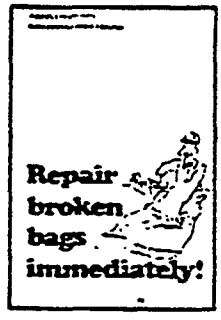

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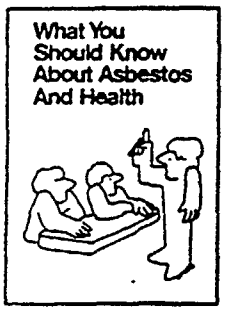

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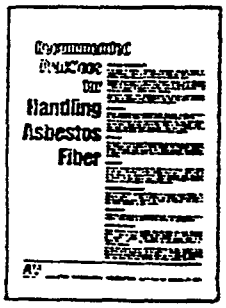

"Recommended Practices for Handling Asbestos Fiber." Heavy coated stock poster, 11"x14" printed blue on white for employee information boards. 25¢ each.

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Also available in 3¾"x9" pamphlet form suitable for mailing in #10 envelope. 10¢ each.

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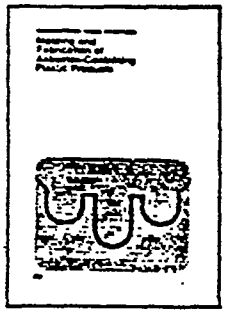

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