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ASBESTOS, HEALTH AND BRAKE LININGS

A Position Paper

Asbestos, one of the world's most versatile and widely used industrial ingredients, is contained in approximately 3,000 different products. Many of these are readily recognizable by every American consumer. In the average home, for example, asbestos is used in a number of common household items -- everything from non-flammable drapes to pot holders and ironing board covers, floor tile to roof shingles. Even the asphalt paving in the driveway.

Asbestos is equally important to the motorist.

It is one of the primary ingredients of brake linings in use on millions of passenger cars and trucks all over the world. For approximately half a century, it has been an automotive industry standard -- the basis of safe, sure stops for every kind of vehicle from a mini-bike to a heavy duty tractor trailer rig.

Bendix Friction Materials Division is one of the world's leading manufacturers of brake linings.

The division, through a predecessor company, can trace its experience with asbestos to the stitched and woven linings of the twenties and early thirties. These were produced on machines powered by

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River. Twisters were used to convert tape into yarn through a process that involved en-ing the tape with brass wire. The yarn then went on big looms, which turned out woven brake lining material in 100 foot rolls.

Production today is much more efficient, involving modern extrusion processes and molding techniques.

Three different product categories require the use of asbestos as a primary ingredient: brake linings for the traditional drum type brakes that have been in use for many years, disc pads for the newer disc brakes that have come into widespread use more recently, and the large brake blocks built for heavy duty trucks.

Bendix, as well as other brake lining manufacturers, has experimented with a variety of brake lining materials through the years. A number of these materials, however, have had shortcomings of one kind or another. Most have simply been unable to measure up to asbestos in meeting the severe braking requirements of modern passenger vehicles and trucks.

Asbestos, a mineral, is available in great abundance and is the most heat resistant of all known natural materials. Combined with resin and other ingredients to increase its own friction characteristics and wear resistance, it can be precisely formulated to meet the specifications of an almost unlimited range of automotive braking requirements. Non-flammable -- even at high temperatures -- it is also lightweight, extremely rugged and relatively low in cost. It comes close to the ideal in being everything a brake lini-
terial should be.

Asbestos has been widely publicized in recent years as a health hazard. This is ironic, because the primary function of asbestos is to save lives -- whether it be used in brake linings, or for fire prevention and retardation purposes in a large number of articles such as protective clothing, insulating materials, building products and theater curtains.

In considering the matter of asbestos and health, it is important to keep everything in proper perspective. The problem is not unique to the asbestos industry alone. There are a number of substances and materials in common use today that can be detrimental to health and safety under uncontrolled conditions.

The key in every instance is a healthy respect for any potential hazard, as well as proper control and caution in the use of all substances and materials that can be injurious in any way.

The old rule of "Safety First" still applies.

According to The Asbestos Information Association, the known facts about asbestos-related disease can be summed up as follows:

1. Asbestos-related health risks today are almost exclusively confined to the occupational setting.

2. The effects of excessive inhalation of asbestos are both time and dose related. This means that asbestos-related diseases may develop, generally, only after the inhalation of substantial amounts of asbestos dust over a substantial period of time. Thus, there are levels of exposure that will not result in any increased risk of disease.

3. There is presently no evidence of risk to the general public from exposure to the minute amounts of asbestos that have been found in community air.

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4. Because of the long latent period of asbestos-related disease, the disease being found today among some long-term industry employees is not an indication of present day conditions, but is a result of conditions existing decades ago, at a time when neither the industry, government, nor the medical profession knew very much about the health effects of asbestos and even less about the proper means for their control.

The type of asbestos used in brake linings is chrysotile, which now accounts for 97 per cent of all asbestos used annually in the United States. Medical studies have shown amosite and crocidolite -- the two other varieties of asbestos that are commercially significant today -- to be more potentially hazardous to health than chrysotile.

Millions of dollars have been invested by the asbestos industry in equipment and techniques to prevent the inhalation of asbestos dust by workers.

Considerable progress has been made since the industry's first standard was established in 1938 by the American Conference of Government Industrial Hygienists. This standard established a threshold limit value (TLV) of five million particles per cubic foot. A new standard was established by the ACGIH in 1961, setting a TLV of 12 asbestos fibers, five microns or longer, per cubic centimeter. This standard was modified in 1970 by reducing the time-weighted average to five fibers per cubic centimeter, with a maximum of 10 fibers per cubic centimeter at any one time.

The 1970 modification was adopted by OSHA as a temporary standard in 1972, and this is the present accepted level. In 1976, how-

ever, a new standard scheduled to go into effect will reduce the TLV to only two asbestos fibers, five microns or longer, per cubic centimeter on a time-weighted average.

The Bendix Corporation's investment in dust control equipment at its Friction Materials Division plants in Troy, N. Y. and Cleveland, Tenn. now totals well over $650,000. An additional expenditure of $150,000 is earmarked for 1974.

These sums are indicative of the large investment required to protect the division's employees and prevent air pollution.

Dust control efforts at the main plant in Troy go back more than 25 years. The division has continuously upgraded its dust collection systems as new methods and technology have become available. This extensive experience at the main plant has also been effectively utilized at the Cleveland Plant, a branch facility established in 1964 to serve the automotive aftermarket.

The most recent advance in dust control this past year involved the installation of new dust pelletizing facilities at a total cost of $429,000 for the Troy and Cleveland plants. These new dust pelletizing facilities are believed to be a first for brake lining manufacturers.

The pelletizing process compacts the loose dust and forms it into round balls that can be as small as tapioca or as large as marbles. The size is controlled by the speed and angle of a rotating disc used to shape the pellets. Dry dust is conveyed directly from large, totally enclosed collection bins -- and moisture is automatically added as the dust feeds into the pelletizer. The pellets are

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formed as the dust hits the spinning disc.

The addition of a small amount of cement hardens the pellets, creating a more permanent bond that is difficult to crumble.

Dust collection at the two Bendix plants is a completely closed operation. Pelletizing even eliminates the dust caused by the emptying of bins for transportation to the dump site. Dust also is eliminated when the hoppers are dumped at the sanitary land fill. Compacting the dust into pellets has the added advantage of conserving space and making more efficient use of the land fill.

Bendix, as well as many other industrial plants working with asbestos throughout the country, is well aware of the facts concerning asbestos. Based on our own experience with asbestos for the past 40 years, it is our feeling that the problem is primarily occupational and in no way represents any danger to the community itself. As is the case with any substance found to be potentially detrimental to health and safety, the real key is prevention. This is accomplished through the safest possible working environment in the factory, and careful observance of safe working practices on the part of all employees.

Bendix is not only making every possible effort to follow industry recommendations for the safe handling of asbestos, but to also observe existing regulations and meet the new standard that will go into effect July 1, 1976.

The problem has been approached at the Friction Materials Division in a variety of ways. In addition to the installation of

sophisticated dust collection systems, employees in exposure areas are provided respirators and wear protective clothing such as caps and shop coats. Dust levels are monitored to determine the asbestos content of the air.

An additional safeguard adopted at the division is an annual chest X-ray for all employees in high exposure areas. Despite the fact that a number of Bendix employees have experienced exposure to asbestos over a long period of time, there has been no indication of any asbestos-related disease. This appears to back up the belief that under properly controlled conditions, when the asbestos content of the air is kept within safe levels, the hazard is minimized.

One of the questions occasionally asked regarding asbestos is whether or not brake linings used on trucks, busses and automobiles release harmful amounts of asbestos dust into community air.

This does not appear to be a problem.

As is the case with approximately 90 per cent of products containing asbestos, the asbestos fibers are solidly locked into the brake linings with resins and polymers. When a vehicle's brakes are applied, a tremendous amount of heat is generated. This changes the chemical nature of the asbestos in the lining, producing a non-fibrous, non-toxic material called fosterite. Studies conducted in the United States and Great Britain have shown that brake lining dust contains only traces of free asbestos fiber.

To further illustrate this, the total amount of free fiber released by brake lining wear throughout the United States in an entire year is less than 20 per cent of the total emissions of

particulate matter in a city the size of Los Angeles in a single day.

An extensive effort regarding asbestos and health research is currently under way in laboratories throughout the world. Much of this is being sponsored and supported by the asbestos industry itself, as well as individual companies acting independently.

Companies also are investigating possible replacements such as fibrous glass, plastics, ceramics and various synthetic materials. At the present time, however, there is no single material available at a reasonable price that can outperform asbestos -- particularly in high temperature applications.

Bendix, for example, has one of the most active research programs in the brake lining field. These efforts resulted in the development of Cerametalix ©, a unique combination of ceramics and copper now extensively used in braking systems for large jet aircraft such as the 747.

Other successful research efforts in recent years have resulted in the development of various metallic and semi-metallic brake linings for heavy duty braking use in large trucks, as well as such vehicles as racing cars, police cars, ambulances and fire trucks.

A new combination lining with considerable promise makes use of the semi-metallic material for one half of a disc brake and traditional organic/asbestos material for the other half. This approach cuts down on the overall use of asbestos and at the same time helps to overcome the higher costs associated with semi-metallics. It also has technical advantages that appear to be superior to either an all organic or all semi-metallic brake.

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