

November 1992

STEWART ABRAMS

BACKGROUND ON THE CONCERNS OF ASBESTOS IN BUILDINGS

Asbestos is the general name for a group of naturally occurring silicate minerals that separate into strong, very fine fibers. It is present in seams or veins in rock formations in various locations around the world. The major deposits are present in Canada, the United States, South Africa, and the Soviet Union. There are several different minerals that are considered to have "asbestos" characteristics. The most common being chrysotile, crocidolite, and amosite.

Raw asbestos is mined in open-pit mines and milled to separate it from non-asbestos rock and breakdown the fibers into sizes that have commercial applications. Processing operations then modify the raw asbestos fiber into commercial products by mixing or blending with other materials, binders and fillers to achieve the desired characteristics.

Asbestos fibers are heat and chemical resistant, strong and flexible, have good thermal and electrical insulating ability, and good friction and wear characteristics. These properties have been utilized in a variety of commercial applications since before 1900.

The primary uses of asbestos have included:

- Acoustical surfacing or finishes on ceilings or walls for sound control and decorative purposes
- Thermal insulation for pipes and boilers for energy conservation, condensation control, and safety
- Fireproofing on structural steel and decking for fire protection
- Tile and sheet flooring and roofing for durability and wear
- Cement pipe and sheets for durability and fire protection

Between 1900 and 1980 over 30 million tons of asbestos was used in commercial products in the United States alone. However, use of asbestos was significantly curtailed in the mid-1970's as knowledge of the adverse health effects of asbestos exposure became known.

W488-0033430



November 1992

THE AIRWAYS

Government agencies began regulating the use and installation of asbestos-containing products in the early 1970's. The first major action occurred in 1970 when New York City banned the use of spray-applied asbestos structural fireproofing. In 1973, the EPA banned the use of spray-applied asbestos insulation and fireproofing. In 1975, EPA banned the use of all asbestos insulating materials. In 1978, EPA extended the ban to include the use of asbestos-containing materials for decorative and acoustical applications. In 1986, EPA proposed a ban on the manufacture and use of all other types of asbestos products within 10 years. These include friction products (brake shoes), cloth products, asbestos-cement pipe, roofing and flooring materials, and asbestos-cement sheet.

EPA has also requires that whenever a building is demolished that all asbestos-containing materials must be removed first. It also requires that prior to any demolition project or a renovation project that involves the removal of more than 260 lineal feet of asbestos pipe insulation or 160 square feet of asbestos equipment insulation or surfacing material, advance notice must be filed with the EPA regional office and the local or state health or environmental regulatory agency.

Many state and local agencies have enacted regulations that impose stricter reporting requirements, specific work practices and procedures for abatement, and contractor certification and licensing.

The OSHA regulations were revised in 1986 to lower Permissible Exposure Limits for asbestos fibers and require specific work practices and exposure controls for any activity involving asbestos.

Serious health problems may occur from the inhalation of airborne asbestos fibers. Exposure to high levels of asbestos is known to cause asbestosis, which is a chronic lung disease that makes breathing progressively more difficult and can lead to death. Asbestos has also been shown to cause various types of cancer. Lung cancer is the most frequently seen asbestos-related disease and is more likely to occur in smokers than non-smokers. The inhalation of asbestos fibers can also cause mesothelioma, which a very painful cancer of the chest and abdominal lining. Studies have shown that mesothelioma rarely occurs without some type of exposure to asbestos. Other types of cancer, primarily of the digestive tract have been associated with asbestos exposure.

The major concern with asbestos exposure is that it is a chronic health hazard. Asbestos-related diseases have long latency periods and, in almost all cases, do not show up until 20 to 40 years after exposures have occurred.

NWBB-0033431

November 1992

STRAITS TIMES

Our current knowledge of asbestos-related health effects is based on the study of workers involved in the manufacture and installation of asbestos-containing products from about 1945 to 1970. In retrospect, these workers were exposed to very high airborne concentrations of asbestos dust. The current exposure to employees and building occupants would be expected to be much lower. However, because of the long latency of asbestos-related diseases, we must base our current assessment of potential risk of disease from low levels of exposure on an extrapolation of the relative risk observed in asbestos workers. On this basis, any exposure to airborne asbestos presents a potential disease risk and should be avoided.

It must be noted that the physical presence of asbestos in a building does not necessarily present a direct health risk. Asbestos must become airborne and be inhaled to present a potential risk. The probability that asbestos will become airborne is dependent upon several factors, primarily the type and the physical condition of the material, and its location.

The only way to determine if asbestos is present in a building and evaluate its potential risk or hazard is to complete an asbestos assessment inspection or survey. This survey should be conducted by a Professional Engineer or Certified Industrial Hygienist having experience and training in asbestos assessment and control. In some states and localities, a special certification or license is required to provide such services. Analysis of bulk and air samples must be completed by a laboratory that is EPA listed and accredited by the American Industrial Hygiene Association.

The asbestos assessment survey has four basic components:

- A review of building drawings, specifications, and maintenance records for references to or indications of the use of asbestos-containing materials
- A complete visual inspection throughout the facility to identify materials suspected as asbestos-containing
- The bulk sampling of suspect materials for laboratory determination of their composition and air sampling to determine potential airborne concentrations, in selected cases
- Preparation of a detailed survey report that identifies the location and extent of asbestos-containing materials that are present, and an evaluation of their condition

HWBB-0033432

TYPICAL USES OF ASBESTOS IN BUILDINGS

<u>TYPE OF MATERIAL</u>	<u>COMMON OR TRADE NAMES</u>	<u>ASBESTOS CONTENT(%)</u>	<u>DATES OF USE</u>
1. <u>STRUCTURAL FIREPROOFING</u>			
- sprayed-on or troweled-on structural members and decking	- Cafco	- Blaze Shield	any range from 1 to 95%
- typically is very friable	- Spraydon	- Fibretek-Spray	
	- Monokote	- Heat Shield	
2. <u>ACOUSTICAL, DECORATIVE, OR INSULATING SURFACING MATERIALS</u>			
- sprayed-on or troweled-on plaster ceilings, concrete decks, and walls	- Limpet	- Spraycraft	any range from 1 to 95%
- typically is very friable	- Soundshell	- Kilnoise	
	- Cafco	- Audi-Cote	
	- Sabinite		
3. <u>PIPE INSULATION</u>			
- may be present on any type of piping	- Newells	- Fabler	1926 to 1949
- chalk-like - magnesite or calcium silicate	- Magnesite	- Cal-Sil	1949 to 1971
- corrugated cardboard - aircell	- Rircell	- Millboard	1910 to 1977
- paperboard - millboard	- JM	- Atlas	
	- Johns Manville		1925 to 1977
4. <u>INSULATION ON FITTINGS</u>			
- fittings include pipe elbows or tees, and packing around valves, flanges, or other such equipment		any range from 15 to 50 %	1900 to 1977
- hard and cement-like, but easily made friable			
- very common on piping that is fiberglass insulated			
5. <u>BOILER, BREEDING, TANKS, OR HVAC EQUIPMENT INSULATION</u>			
- this covering typically consists of asbestos blocks covered with chicken wire or metal lathe, that is then covered with asbestos-cement and canvas lagging		any range from 5 to 50 %	1900 to 1977
- may consist of a thick layer of asbestos-cement or paper over a non-asbestos insulating material, that is covered by a canvas lagging			
- common on hot water tanks, chillers, HVAC equipment and ductwork			
6. <u>SUSPENDED CEILING TILES OR PANELS</u>			
- not very common		any range from 5 to 20%	1960 to 1975
- may be found in locations requiring a fire-rated ceiling (i.e., kitchens, laboratories)			

HRT 10/22/87

2661 requiaoN

STWV'RTG'ITV' "Teg'RT IN"IT

434300-8044

TYPE OF MATERIAL

COMMON OR TRADE NAMES

ASBESTOS CONTENT(%)

DATES OF USE

7. FLOOR COVERINGS

- non-friable

-vinyl asbestos tile
-MRT

may range from
20 to 30%

1930 to present

-resilient adhesive backing
-asphalt asbestos tile

8. ROOFING MATERIALS

- non-friable

-asphalt shingles
-composite slate shingles
-roofing felts
-roof coatings and sealants
-roofing or siding shingles

may range from
1 to 30%

1900 to present

9. CONCRETE-LIKE PRODUCTS

- non-friable

-transite board or pipe
-siding or roofing panels
-a/c board or pipe
-concrete exhaust stack or flue
-concrete pipe or conduit

may range from
10 to 50%

1930 to present

10. MISCELLANEOUS ASBESTOS-CONTAINING MATERIALS

-commonly present in small quantities
-usually in a non-friable state

-caulking, spackles, joint compounds
-canvas vibration/expansion joint on HMRC equipment
-fire blankets, welding curtains, theatre curtains

may range from
3 to 100%

1920 to present

The material in this table was compiled, with modifications, from EPA Document 560/5-85-024, "Guidance for Controlling Asbestos-Containing Materials in Buildings"; NBSIR 83-2689, "Guidelines for Assessment and Abatement of Asbestos-Containing Materials in Buildings"; and "Asbestos Exposure Assessment in Buildings - Inspection Manual," USEPA Region 7, October, 1982.

HRT 10/22/87

2661 JOQUAON

STWVBRVJFJGJNII