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ASBESTOS

ITS INDUSTRIAL APPLICATIONS

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PREFACE

This book discusses the many varied applications of asbestos. Its purpose is to provide background as well as factual information on the uses of asbestos. Asbestos is utilized in a wide range of products, though its identity is often obscured. The discussion in this book is primarily concerned with the more familiar specialized products.

Asbestos can be classified both as an old product and as a new one. History has justified its usefulness. The accelerated pace at which technology is advancing in this atomic and space age has created many new demands on basic materials and the need for developing new and improved products at a more rapid rate.

The technological advances in the use of asbestos have produced some large and important industries. This does not mean that asbestos will supplant other established materials, any more than it can be expected that other products will eliminate asbestos. The possibility of new uses for asbestos is far from exhausted. Because of such technical advances and scientific research, diversified products have been developed. Valuable new properties of asbestos have been determined, which in turn account for its many new applications. These, as well as improved products, are included in this volume.

The increase in asbestos products in the past 2,000 years has been a milestone in world growth. The atomic age has been reached as a result of the achievements made in working with such materials as asbestos. Asbestos used in conjunction with new chemicals continues to make important

depending upon weather conditions and the season of the year. The moisture is removed by means of mechanical driers. The dry fiber can then easily be removed by air suction. The process of separating asbestos from rock during the milling operation takes into account the specific gravity difference of the two materials.

After the drying operation, the rocks which range in size from 2 to 3 in. are fed into a third crushing unit which is either of the gyratory type or of the cone type. The crushed ore and fiber are fed to heavy shaker or bumper screens which are operated by means of eccentric drives. Powerful air suction hoods remove fiber. The rock passes over the end of the screens. The undersize material then passes through the screen, after which it is fed to a fiberizer for further treatment.

Additional shaking screens are used to separate fibers into long, medium and short categories. Duplex shaking screens are used. The long fibers remain on the top of the screen, the medium fibers in the lower screen and the short fiber passes through both screens. The rock which was passed over the end of the heavy shaking screens continues to other crushers. The cycle is repeated whereby the crushed rock passes over shaking screens and in turn fiber is removed by air-suction.

After the last crushing cycle, the remaining rock is separated by means of fiberizers. The fiberizers break the rocks by means of impact or direct blow of high speed hammers. The crushed stone is again fed through the shaking screen in order to remove additional fiber. See Figure 1.7.

The milling operations are continuous. After the crushing and suction operations, the asbestos is cleaned, graded and put into bags for shipment.

Introduction

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(Courtesy The Ruberoid Co.)

Figure 1.7. Shaking tables are the key to asbestos fiber separation. Finally crushed ore is passed over a vibrating screen which forces fibers to rise above the heavier bits of rock. At the end of the table the vacuum pick-up captures the loose asbestos, draws it through grading screens and into storage bins for packing.

Health and Safety Factors

With the development of the asbestos industry, contamination of the air by small asbestos fiber particles produced health problems. Hygienic measures were not well advanced when the first mining operations were developed. Inasmuch as the dry processing method is used in mining and milling asbestos, small fiber particles are picked up by air currents and distributed throughout the manufacturing plants and in

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the neighborhoods. The asbestos particles or dust which developed could become harmful to the people who were constantly exposed to it.

Asbestosis is a special type of silicosis; however, it does not occur as often as silicosis. Approximately 10 years is required for a person to develop asbestosis if he is constantly exposed to the dust. However, since protective measures are provided by the manufacturing plants, it is extremely rare that a person develops asbestosis.

Chemical analysis can be made of dust in order to determine concentration of asbestos dust particles. Information is available on the maximum concentration that can exist without creating a health problem. Such varied safety measures are available as well ventilated areas, special masks, and water sprinkler systems. Proper filtration devices for collecting dust particles are available.

Products and Markets

Basic and applied research and development programs have been carried out for many years on asbestos materials and their products. The consumption and sales of asbestos as well as the diversity of its applications have been steadily increasing. New mine deposits have been located and improved mining processes have been discovered. These in turn have stimulated new product development. The future growth of the industry may be estimated from an analysis of the items in Table 1.7. Asbestos products are important contributors to the comfort and safety of mankind; they are also important base materials for our highly scientific and space age. Materials exist for insulating the home, operating automobiles, reducing or eliminating fire hazards in industry and at home, protecting buildings,

TABLE 1.7. ASBESTOS APPLICATIONS *

Raw Asbestos

Yarn	Thread
Wick packing	Rope packing
Felt	Paper (plain and corrugated)
Rollboard	Millboard
Insulating wire	Compressed sheet packing
85% Magnesite pipe covering, blocks and locomotive lagging	High temperature insulation (molded or various types)
Compound for encasing of motor windings	Molded composition for electrical and other purposes
Molded brake lining and brake blocks	Automobile bodies and railway sleepers (molded composition)
Reinforcement in plastics	Filler in plastics
Flooring	Pottery and sculpture
Asbestos cement products	Plaster and stucco
Paints, varnishes and fillers	Sprayed asbestos (acoustical)
Filling for asbestos mattress in- sulation	Insulation of batteries (loose fiber)
Insulation of walls and floors (loose fiber)	In foundations (to resist shock)
Insulation in underground con- duits (loose fiber)	Packing for explosives or other materials
Wadding in cartridges and timing devices	Filter fibers and filter pads
Platinized asbestos fiber for filter- ing	Coating for welding rods
In cheese making (spores are placed on asbestos)	Sewer pipe
Asphalt floor tile	Automobile body undercoating
Adhesive	

Asbestos Yarn

Cloth	Tape, electrical and other
Brake lining	Clutch facings
Packing, valve stem, braided and other	Gas mask filters
Gaskets and gasket cloth	Tubing
Wick for oil burning apparatus	Rope
Twine or sewing thread	Stocking for lead cable
Electric fixture wire covering	Electric cable covering
Typing gas mantles	Spark plugs
Edges for hair felting	Steam hose
Fire-retardant hose	