

NATIONAL INVENTORY OF SOURCES AND EMISSIONS: CADMIUM, NICKEL, AND ASBESTOS - 1968. ASBESTOS, SECTION III

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U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards

ASBESTOS IMPORTS

During 1968, asbestos imports were 737,998 short tons. Approximately 54 percent of the import total was from Canada and 5 percent was from the Republic of South Africa.^{1/}

ASBESTOS EXPORTS

Asbestos exports, during 1968, were 41,216 short tons.^{2/}

^{1/2} - Bureau of Mines Minerals Yearbook - 1968

REPROCESSING

The apparent consumption of asbestos in the United States, during 1968, has been reported at 817,363 short tons.^{1/}

FRICTION MATERIALS

Asbestos is regarded as indispensable in most types of friction materials. It is used as the primary constituent in brake linings and clutch facings for motor vehicles, and other commercial and industrial equipment.

Brake linings are of two principal types. In the early days of the automobile, virtually all brakebands were of woven asbestos fabrics but now the molded type is used extensively. Molded linings consist of asbestos fibers bonded with an organic matrix. Metallic reinforcing is commonly added, and the shaped products are thoroughly cured. Chrysotile asbestos is required, ranging in fiber length from the very short grades to those just under spinning grades.

In the United States the use of asbestos in friction materials during 1968 was about 164,000 short tons.^{1/} Reprocessing plants producing friction materials are listed in Appendix A.

^{1/} - Bureau of Mines Minerals Yearbook - 1968

^{2/} - Estimate based on reports from reprocessing companies and data from the 1967 Census of Manufacturers.

INTRODUCTION

An outstanding characteristic of the asbestos industry is that a very large proportion of the fiber is mined, imported, processed, and re-processed by a relatively few companies. Very little of the finished product is sold to the consumer trade.

The original use of asbestos was based on its heat resistance properties, but the current use is more often as a binder, such as in asbestos cement products.

The asbestos fibers are usually sold in 100 pound bags which are paper bags or jute bags which sometimes have a plastic liner. The disposal of these bags seems to present a problem to the industry. A few are able to use the paper bags in the product being produced, but many more are still seeking a satisfactory solution.

FRICTION MATERIALS

One of the largest uses of the friction material is in brake linings of the molded type. The molded linings, consisting of asbestos fibers bonded with an organic matrix, contain approximately fifty percent asbestos. As a part of the manufacturing process, the linings must be shaped and finished by grinding after they are formed. This

creates a substantial loss of asbestos, as much as thirty percent. With such a grinding procedure an adequate exhaust and collection system is essential.

A large manufacturer of brake linings reported 4000 tons of asbestos collected in bag filters at one plant during 1958 and described his collection system. The estimated overall atmospheric emissions of asbestos to be 0.25 to 0.50 percent, based on the efficiency of his collection equipment. Other manufacturers provided some information regarding the type of collection equipment in operation, but not data or estimates of asbestos emissions.

On the basis of information obtained an emissions factor of 8 pounds per ton of asbestos processed is estimated, and asbestos emissions to the atmosphere during 1958 are 312 short tons.

filter, were sold to a contractor during 1968 for use on roads. It is reported that an appreciable amount is used in Vermont for roads. ¹ This could not be confirmed, since permission to visit the mine and mill was denied.

Construction

Workers in all trades in the construction industry come in contact with asbestos. Heating ducts are often insulated with asbestos, and steam piping is nearly always covered with a material containing asbestos. Electricians strip asbestos insulation from wires, and the carpenter saws asbestos siding, wallboard, and shingles. As a result, there is asbestos released to the air around the construction sites.

Asbestos emissions to the atmosphere at construction sites are estimated at 61 short tons for 1968.

Brake Linings

Motor vehicle wear during 1968 totaled one trillion miles, and replacement brake linings were required for about 25 to 30 million vehicles. It is the usual practice, when installing new brake linings,

1. Batey-Timothy Co. Asbestos Mineral Facts and Problems; Bureau of Mines Bulletin 810 - 1965

to fit the linings to the drums by grinding, and the amount of grinding required varies depending on the condition of the brake drum.

Data concerning motor vehicle brake linings:

Vehicle miles during 1968	1,019,000,000
Mileage life of brake linings	27,500
Brake lining sets on new vehicles	10,719,000
Pounds of asbestos per set of brake linings	3
Assumed loss to atmosphere during grinding and fitting - percent	8.5

Based on the above, the emissions factor is 10 pounds per ton of asbestos processed, and the asbestos emissions to the atmosphere during 1968 were 190 tons.

Steel Framing

Several spray-on materials that contain asbestos are used extensively on steel columns and other structures as a fire protection measure. The application of such materials is often required by code. Even though the building frame may be covered by a temporary enclosure when the material is sprayed, the workmen are exposed to an atmosphere that is virtually saturated with asbestos fiber.

Asbestos emissions to the atmosphere, due to the use of spray-on fireproofing during 1968, are estimated at 15 short tons.

based on an emissions factor of 10 pounds per ton of asbestos applied.

Motor Vehicle Use

It is obvious that there are substantial particulate emissions from the wear of motor vehicle brake linings and clutch facings. This has been reported as a primary source of asbestos emissions to the atmosphere; however, there are conflicting reports indicating that the asbestos fiber has been destroyed by the heat of friction.

In this report the estimate of emissions does not include an amount for the wear of motor vehicle brake linings and clutch facings.

Insulating Cement

Insulating cement that contains asbestos is used extensively in all types of boilers. It is used for pointing up joints and cracks in stack and breeching linings, and for surfacing block insulation that is installed inside breechings, ducts and downcomers.

During the boiler operation, as the flue gas passes through the boiler some of the insulating cement is worn away and carried along through the dust collector, up the stack, and into the atmosphere.

Based on the following assumptions, an emissions factor of 33

pounds per ton of asbestos applied is calculated for the use of insulating cement.

1 - Fifteen percent of the insulating cement worn away during use.

2 - Dust collector efficiency - 85 percent (average)

Asbestos emissions to the atmosphere during 1958 due to the use of insulating cement are estimated at 75 short tons.

ASBESTOS MINES IN THE UNITED STATES

STATE	LOCATION
ARIZONA	
Asbestos Manufacturing Company	Gila County
Isaiah's Mining Corporation	Gila County
Asbestos Asbestos Corporation	Gila County
CALIFORNIA	
Atlas Minerals Corporation	Fresno County
Coalbrook Asbestos Company (1)	Fresno County
Facile Asbestos Corporation (2)	Calaveras County
Union Carbide Corporation	San Benito County
NORTH CAROLINA	
Forbairn Mining Company	Yancey County
VERMONT	
GAF Corporation	Orleans County

(1) - Owned by Johns-Manville Corporation

(2) - Acquired by H. K. Porter Company, Inc. during 1958.

REPROCESSING PLANTS PRODUCING ASBESTOS FRICTION MATERIALS

STATE	LOCATION
CALIFORNIA	
H. Krasne Manufacturing Company	Los Angeles
Silver Line Brake Lining Corporation	Los Angeles
Lasco Brake Products Corporation, Ltd.	Oakland
CONNECTICUT	
H. K. Porter Company, Inc.	Middletown
Raybestos-Manhattan, Inc.	Sturford
ILLINOIS	
Gair Corporation	Chicago
Grizzly Brake Division of Mar Pro Inc.	Chicago
The L. S. Wiley Company	Chicago
Johns-Manville Corporation	Waukegan
INDIANA	
Raybestos-Manhattan, Inc.	Crawfordsville
H. K. Porter Company, Inc.	Huntington
World Design Company	New Castle
(sub. of Firestone Tire & Rubber Co.)	
KENTUCKY	
H. K. Porter Company, Inc.	Richmond
MASSACHUSETTS	
Auto Friction	Lawrence
MICHIGAN	
American Brakeblock - Division Amco Corp.	Birmingham
American Brake Shoe Company	Troy

NEW JERSEY

Johns-Manville Corporation
 DuPont Manufacturing Company, Inc.
 Raybestos-Manhattan, Inc.
 H. K. Porter Company, Inc.

Manville
 Newark
 Passaic
 Trenton

NEW YORK

Donahue Corporation

Troy

NORTH CAROLINA

Southern Friction Materials Company

Charlotte

OHIO

American Brake Shoe
 General Motors Corporation
 Macromon Corporation

Cleveland
 Dayton
 Paulding

PENNSYLVANIA

Raybestos-Manhattan, Inc.
 H. K. Porter Company, Inc.

Marbleton
 Pittsburgh

TEXAS

Granada Brake Lining Company

Houston

TENNESSEE

Beckley Corporation

Cleveland

VIRGINIA

American Brake Shoe

Winchester

(Timothy Register, Inc., 1958 Ed. Fortune-1956 Plant & Product
 Director The 1960 Largest U.S. Industrial Corporations; U.S.
 Register Corporation.)

REPROCESSING PLANTS PRODUCING ASBESTOS CEMENT PRODUCTSALABAMA

U. S. Cast Iron Pipe Company
 GAF Corporation
 Camenz Asbestos Products Company

LOCATION

Akron
 Mobile
 Woodward

CALIFORNIA

Southern Pipe & Casting Company
 Johns-Manville Corporation
 Johns-Manville Corporation
 Central-Tread Products Corporation
 Central-Tread Products Corporation
 Johns-Manville Corporation

Axum
 Long Beach
 Pittsburgh
 Riverside
 Santa Clara
 Stockton

CONNECTICUT

Tile Roofing Company

Stratford

GEORGIA

Unihoyal, Inc.
 GAF Corporation

Hogansville
 Fort Wentworth

ILLINOIS

Acme Asbestos Covering & Flooring Company
 Asbestite & Magnesia Materials Company
 Flintkote Company
 Western State Company
 Tel-Fix, Inc.
 Johns-Manville Corporation

Chicago
 Chicago
 Chicago
 Elmhurst
 Skokie
 Waukegan

INDIANA

U. S. Gypsum Company

East Chicago