Asbestos

By D. O. Kennedy [1] and Annie L. Mattila [2]

THE WORLD production of asbestos was nearly as high in 1956 as in 1955—approximately 1¾ million tons. Canadian production decreased slightly but was still over 1 million tons. Production within the United States declined for the third successive year and amounted to about 2 percent of the world production. Imports and consumption in the United States declined 7 percent in 1956 compared with 1955. Imports of low-iron chrysotile of spinning lengths from British Columbia were about the same as in 1955—close to 7,000 tons—but imports of shorter fibers from British Columbia increased. Imports of Canadian spinning fibers decreased 6 percent compared with 1955.

TABLE 1.—Salient statistics of the asbestos industry in the United States, 1947–51 (average) and 1952–56

	1947–51 (average)	1952	1953	1954	1955	1956
Domestic asbestos:						
Produced—short tons	39, 676	53, 888	57, 950	45, 813	44, 752	41, 626
Sold or used—do	39, 719	53, 864	54, 456	47, 621	44, 580	41, 312
Value	$2, 435, 357	$4, 713, 032	$4, 857, 359	$4, 697, 962	$4, 487, 428	$4, 742, 446
Imports (unmanufactured) short tons	643, 883	709, 469	692, 245	678, 390	740, 423	689, 034
Value	$41, 508, 089	$61, 604, 601	$59, 753, 583	[1] $55,856,606	[1] $60,957,578	[1] $61,829,275
Exports (unmanufactured) [2] short tons	13, 874	10, 724	3, 076	1, 894	2, 787	2, 950
Value	$2, 827, 982	$2, 670, 970	$592, 222	$291, 157	$267, 776	$374, 964
Apparent consumption short tons	669, 728	752, 609	743, 625	724, 117	782, 216	727, 396
Exports of asbestos products [2]	$10, 520, 505	$13, 028, 857	$10, 627, 293	$11, 484, 735	$12, 858, 504	$14, 181, 122

[1] Owing to changes in tabulating procedures by the U. S. Department of Commerce, data known to be not strictly comparable with earlier years.
[2] Includes material that has been imported and subsequently exported without change.

DOMESTIC PRODUCTION

Domestic output of asbestos decreased 7 percent in 1956, compared with 1955, reflecting a 3-percent decrease in Vermont production and a 24-percent decrease in Arizona. A small quantity of both amphibole and chrysotile asbestos was produced in California, but production of amphibole in North Carolina and Georgia was suspended.

The Vermont Asbestos Mines Division of the Ruberoid Co., operating in Vermont, continued to be the one large asbestos producer in the United States. Although over 3 percent of the fiber produced was of spinning grade, only a small part of it was sold for textile use; most of it was used in electrolytic cells.

[1] Assistant chief, Branch of Construction and Chemical Materials.
[2] Statistical assistant.

Minerals Yearbook: Asbestos Chapters, 1956
ACL Doc 10995 · Page 1 of 13
Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/1

The purchase program for acquiring Government warehouse stocks of Arizona asbestos, conducted by the Materials Branch, Emergency Procurement Service, was completed early in 1956. By Congressional action (Public Law 733, 84th Congress, dated July 19, 1956), a new program was established whereby the U. S. Department of the Interior was authorized to purchase domestic nonferrous chrysotile asbestos meeting the same specifications and under the same regulations as those in effect during the former purchase program. The prices to be paid were those in effect January 1, 1956. Purchases were not to exceed 2,000 tons of Nos. 1 and 2 combined and not to exceed 2,000 tons of No. 3, except that No. 3 might be purchased only when offered with No. 1 or No. 2 or both in ratio not to exceed 1 ton of No. 3 to 1 ton of No. 1 or No. 2 or both. The Interior Department delegated the authority to make these purchases to General Services Administration July 31, 1956. Purchases were made with funds remaining from the previous program, and no new funds were authorized for the new program in 1956. Production in Arizona virtually ceased when the first program was completed and was not resumed until after the passage of Public Law 733 in July. Stimulated by the 2 purchase programs, production of the longer fibers (crudes Nos. 1, 2, and 3) increased 14 percent in 1956 compared with 1955, but production of shorts decreased 35 percent. During 1956, 94 percent of all crudes Nos. 1, 2, and 3 sold were purchased by the Government.

Ten companies operated in Arizona in 1956; but, as in previous years, 5 of them produced 97 percent of the State total. The following firms and individuals produced chrysotile in the Globe district of Arizona in 1956: American Asbestos Cement Corp., American Fiber Corp., Barry De Rose, Jaquays Mining Corp., Kyle Asbestos Mines of Arizona, Lawrence D. Poor, Metate Asbestos Corp., Phillips Asbestos Mines, Via Development Co., and Western Chemical Co.

The Bureau of Mines issued a report[3] describing 18 deposits in Arizona that were not discussed in a previous report (Information Circular 7706) published in 1955. Key maps in both reports showed the locations of all mines and deposits. A small quantity of short-fiber chrysotile was produced by the Tabor Mining Co. from the Phoenix mine in Napa County, Calif. The Huntley Industrial Minerals, Inc., produced a small quantity of amphibole asbestos in Inyo County, and Zimdars & Delmue produced tremolite from the Noon Day mine in the Iowa Hill district.

CONSUMPTION AND USES

Consumption of asbestos decreased 7 percent in 1956 compared with 1955. This decrease was entirely in the chrysotile variety, as imports of amosite were virtually unchanged, and imports of crocidolite were 24 percent greater in 1956 than in 1955. Nearly 96 percent of the asbestos consumed was chrysotile; of this only 24,000 tons (approximately 3 percent) was of spinning grade.

As asbestos was employed extensively in building construction, as well as in many industries, trends in asbestos consumption, industrial production, and volume of new construction are shown in figure 1.

[3] Stewart, Lincoln A., Chrysotile-Asbestos Deposits of Arizona (Supp. to Inf. Circ. 7706): Bureau of Mines Inf. Circ. 7745, 1956, 41 pp.

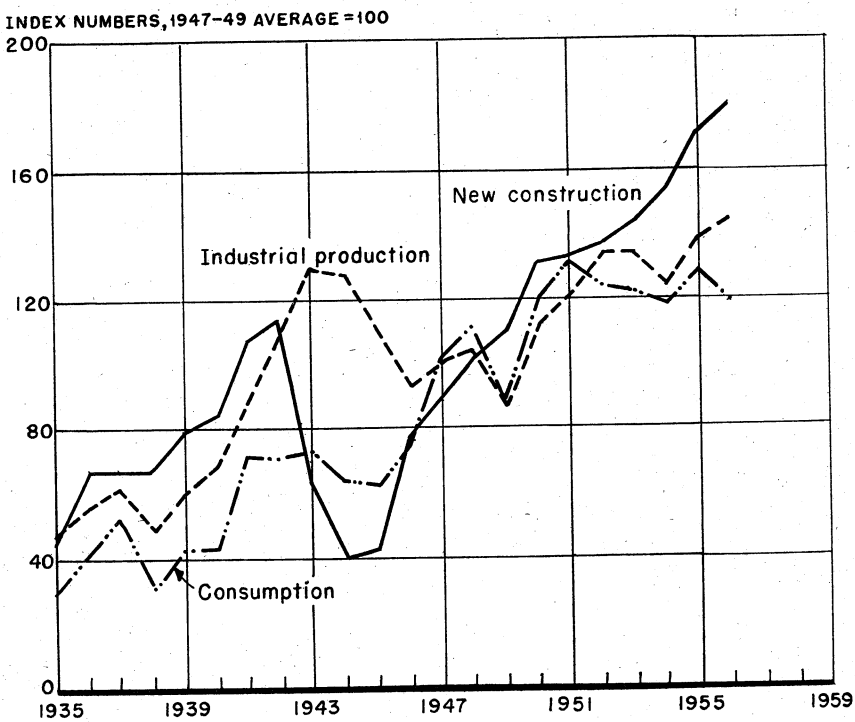


FIGURE 1.—Consumption of asbestos compared with total new construction and industrial production 1935–1956. Statistics on value of construction from Bureau of Foreign and Domestic Commerce and on industrial production from Federal Reserve Board.

TABLE 2.—Apparent consumption of raw asbestos in the United States, 1947–51 (average) and 1952–56

Year	Short tons	Value	Year	Short tons	Value
1947–51 (average)	669, 728	$41, 115, 464	1954	724, 117	$60, 263, 411
1952	752, 609	63, 646, 663	1955	782, 216	65, 177, 230
1953	743, 625	64, 018, 720	1956	727, 396	66, 196, 757

PRICES

Price increases were announced by Canadian Johns-Manville Co., Ltd., in December 1955, amounting to about 10 percent for all long-fiber grades of chrysotile and 5 percent for all short fibers. The new price schedule, shown below, held throughout 1956:

Grade	*U. S. dollars per ton*
Crude No. 1	$1, 400–$1, 725
Crude No. 2	750– 1, 100
No. 3—Spinning fiber	350– 575
No. 4—Shingle fiber	170– 225
No. 5—Paper fiber	110– 140
No. 6—Plaster fiber	82
No. 7—Shorts	38– 75

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/3

The Arizona quotations, unchanged during 1956, were as follows:

Grade	Per ton f. o. b. Globe, Ariz.
No. 1 crude	$1, 500–$1, 750
No. 2 crude	900– 1, 050
No. 3 crude	400– 450
Filter fiber	250– 450

African asbestos was sold by negotiation with individual purchasers, and there were no market quotations. Department of Commerce reports show the following average figures for imports in 1955 and 1956, per short ton:

	1955	1956
Amosite: Union of South Africa	$125. 38	$126. 51
Crocidolite:		
Bolivia	-------	92. 74
Australia	229. 00	224. 09
Union of South Africa	206. 06	186. 46

FOREIGN TRADE [4]

Imports.—During 1956 imports of chrysotile asbestos totaled 654,845 tons, an 8-percent decrease from 1955. Although imports of amosite remained about the same as in 1955 and imports of crocidolite increased, these represented only 5 percent of the total imports; and total imports decreased 7 percent in 1956 compared with 1955. Nearly 92 percent of the 1956 imports originated in Canada, but so much of the Canadian imports was of short fiber that the Canadian imports represented only 85 percent of the total value of all imports of asbestos into the United States in 1956.

TABLE 3.—Asbestos (unmanufactured) imported for consumption in the United States, 1947–51 (average), 1952–54 (totals), and 1955–56, by countries and classes

[Bureau of the Census]

Country	Crude (including blue fiber)		Mill fibers		Short fibers		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1947–51 (average)	35, 281	$5, 889, 814	[1]174, 010	[1]$19,337,583	434, 593	$16, 280, 692	643, 884	$41, 508, 089
1952	38, 636	8, 048, 835	212, 684	31, 292, 506	458, 149	22, 263, 260	709, 469	61, 604, 601
1953	39, 201	9, 052, 007	170, 692	27, 521, 438	482, 352	23, 180, 138	692, 245	59, 753, 583
1954	37, 461	7, 502, 358	148, 962	24, 556, 953	491, 967	23, 797, 295	678, 390	55, 856, 606
1955								
North America: Canada	873	471, 279	167, 191	27, 388, 074	531, 023	25, 215, 464	699, 087	53, 074, 817
South America: Venezuela	-------	-------	1	435	-------	-------	1	435
Europe:								
France	-------	-------	-------	-------	7	589	7	589
Germany, West	-------	-------	2	278	-------	-------	2	278
Italy	-------	-------	8	9, 310	-------	-------	8	9, 310
Portugal	4	538	-------	-------	-------	-------	4	538
United Kingdom	-------	-------	72	20, 642	9	9, 627	81	30, 269
Yugoslavia	558	23, 276	6	575	-------	-------	564	23, 851
Total	562	23, 814	88	30, 805	16	10, 216	666	64, 835

See footnotes at end of table.

[4] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/4

TABLE 3.—Asbestos (unmanufactured) imported for consumption in the United States, 1947–51 (average), 1952–54 (totals), and 1955–56, by countries and classes—Continued

Country	Crude (including blue fiber)		Mill fibers		Short fibers		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1955—Con.								
Africa:								
British East Africa	----	----	----	----	12	$1,358	12	$1,358
Rhodesia and Nyasaland, Federation of [2]	8,168	$1,999,787	237	$73,041	15	4,312	8,420	2,077,140
Southern British Africa	189	42,458	----	----	----	----	189	42,458
Union of South Africa [3]	27,508	4,745,488	635	105,172	557	79,168	28,700	4,929,828
Total	35,865	6,787,733	872	178,213	584	84,838	37,321	7,050,784
Oceania: Australia	3,348	766,707	----	----	----	----	3,348	766,707
Grand total	40,648	8,049,533	168,152	[4] 27,597,527	531,623	[4] 25,310,518	740,423	[4] 60,957,578
1956								
North America: Canada	273	208,248	155,961	27,814,601	477,512	24,261,803	633,746	52,284,652
South America:								
Bolivia	34	3,153	----	----	----	----	34	3,153
Venezuela	120	17,866	14	2,740	11	2,316	145	22,922
Total	154	21,019	14	2,740	11	2,316	179	26,075
Europe:								
Germany, West	----	----	----	----	40	1,530	40	1,530
Greece	2	400	----	----	----	----	2	400
Italy	----	----	11	12,060	----	----	11	12,060
Portugal	5	560	----	----	----	----	5	560
U. S. S. R.	----	----	6	2,750	----	----	6	2,750
United Kingdom	----	----	127	32,671	193	48,688	320	81,359
Yugoslavia	3,735	141,275	----	----	----	----	3,735	141,275
Total	3,742	142,235	144	47,481	233	50,218	4,119	239,934
Africa:								
British East Africa	----	----	13	1,199	9	1,494	22	2,693
French Morocco	----	----	3	3,111	----	----	3	3,111
Rhodesia and Nyasaland, Federation of [2]	14,271	2,927,727	339	180,117	30	14,244	14,640	3,122,088
Union of South Africa [5]	32,774	5,381,599	199	28,097	202	35,146	33,175	5,444,842
Total	47,045	8,309,326	554	212,524	241	50,884	47,840	8,572,734
Oceania: Australia	3,150	705,880	----	----	----	----	3,150	705,880
Grand total	54,364	[4] 9,386,708	156,673	[4] 28,077,346	477,997	[4] 24,365,221	689,034	[4] 61,829,275

[1] Includes 11 tons ($1,632) classified by the Bureau of the Census as "amosite, crude"; reclassified by Bureau of Mines as "mill fibers."
[2] Believed to be all from Southern Rhodesia.
[3] Includes 1 ton ($336) of blue crocidolite credited by the Bureau of the Census to United Kingdom.
[4] Owing to changes in tabulating procedure by the Bureau of the Census data known to be not comparable with years before 1954.
[5] Includes 225 tons ($57,304) of chrysotile crudes, 30 tons ($5,820) of blue crocidolite, and 15 tons ($3,875) of short fibers credited by the Bureau of the Census to Mozambique, 302 tons ($34,020) of amosite crude credited by the Bureau of the Census to The Federation of Rhodesia and Nyasaland; 2 tons ($785) of amosite crude credited by the Bureau of the Census to the United Kingdom and 2 tons ($679) of blue crocidolite believed to have originated in the Union of South Africa and processed in the United Kingdom.

Chrysotile fibers of spinning length (Canadian crudes Nos. 1 and 2 and spinning fiber No. 3) were available in excess of United States requirements in 1956. Except for a few hundred tons imported from Southern Rhodesia, virtually all of the spinning-grade chrysotile was imported from Canada. Imports of low-iron chrysotile of spinning

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/5

grade from British Columbia increased from 5,742 tons in 1955 to 6,982 in 1956.

TABLE 4.—Asbestos (chrysotile) imported for consumption in the United States from Canada, by grades, 1947–51 (average) and 1952–56, in short tons

[Bureau of the Census]

Grades	1947–51 (average)	1952	1953	1954	1955	1956
Crude No. 1	232	144	168	82	65	50
Crude No. 2	255	332	207	181	164	217
Other crudes	416	79	467	844	644	6
Spinning or textile fiber	19,845	24,112	19,417	18,319	21,339	20,638
Shingle fiber	82,524	98,577	86,540	72,242	83,898	83,032
Paper fiber	69,698	87,644	63,139	57,465	61,954	52,291
Short fiber	434,578	458,012	482,179	491,149	531,023	477,512
Total	607,548	668,900	652,117	640,282	699,087	633,746

TABLE 5.—Asbestos (chrysotile) imported for consumption in the United States from Southern Rhodesia [1] by grades, 1947–51 (average) and 1952–56, in short tons

[Bureau of the Census]

Grades	1947–51 (average)	1952	1953	1954	1955	1956
Crude No. 1	1,358	462	1,039	181	105	61
Crude No. 2	2,982	1,363	814	275	162	71
Spinning or textile fiber	156	177	730	156	76	339
Other crude	[2] 5,357	8,296	7,304	6,243	7,901	14,139
Shingle fiber		245	103		161	
Short fiber	6			364	15	30
Total	9,859	10,543	9,990	7,219	8,420	14,640

[1] Effective July 1, 1954, reported by the Bureau of the Census as Federation of Rhodesia and Nyasaland. Believed to be all from Southern Rhodesia.
[2] Includes small amounts credited by the Bureau of the Census to Mozambique.

Imports of crocidolite from the Union of South Africa increased nearly 32 percent to a high of 19,270 tons in 1956, but imports of chrysotile and amosite from the Union of South Africa were virtually unchanged.

TABLE 6.—Imports of amosite, crocidolite, and chrysotile into the United States from Union of South Africa, 1952–56, in short tons

[Bureau of the Census]

	1952	1953	1954	1955	1956
Amosite	[1] 18,323	15,261	14,634	11,745	[2] 11,735
Crocidolite	6,885	7,781	10,911	[3] 14,592	[4] 19,270
Chrysotile	1,694	3,388	1,855	2,363	[5] 2,170
Total	26,902	26,430	27,400	[3] 28,700	33,175

[1] Includes 105 tons credited by Bureau of Census to Mozambique.
[2] Includes 302 tons credited by Bureau of Census to Southern Rhodesia and 2 tons credited by Bureau of Census to United Kingdom.
[3] Includes 1 ton credited by Bureau of Census to United Kingdom.
[4] Includes 30 tons credited by Bureau of Census to Mozambique and 2 tons credited by Bureau of Census to United Kingdom.
[5] Includes 240 tons credited by Bureau of Census to Mozambique.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/6

Exports.—Exports of raw asbestos increased slightly in 1956. Compared with the quantity of asbestos imported and consumed in the United States, the quantity exported was insignificant (less than 0.5 percent).

TABLE 7.—Asbestos and asbestos products exported from the United States, 1947–51 (average) and 1952–56

[Bureau of the Census]

Year	Unmanufactured asbestos				Asbestos products	
	Domestic [1]		Foreign [2]		Domestic [1]	Foreign [2]
	Short tons	Value	Short tons	Value	Value	Value
1947–51 (average)	11,893	$2,392,803	1,981	$435,139	$10,508,121	$12,384
1952	10,265	2,550,065	459	120,905	13,027,739	1,118
1953	2,780	540,273	296	51,949	10,615,832	11,461
1954	1,847	275,778	47	15,379	11,475,082	9,653
1955	2,161	236,336	626	31,440	12,820,917	37,587
1956	2,797	337,696	153	37,268	14,171,309	9,813

[1] Material of domestic origin, or foreign material that has been milled, blended, or otherwise processed in the United States.
[2] Material that has been imported and subsequently exported without change.

TABLE 8.—Asbestos and asbestos products exported from the United States, 1955–56, by kinds

[Bureau of the Census]

Products	1955		1956	
	Quantity	Value	Quantity	Value
Unmanufactured asbestos:				
Crude and spinning fibers—short tons	240	$48,858	514	$107,022
Nonspinning fibers—do	287	42,817	301	54,654
Waste and refuse—do	1,634	144,661	1,982	176,020
Total unmanufactured—do	2,161	236,336	2,797	337,696
Asbestos products:				
Brake lining and blocks:				
Molded, semimolded, and woven	(1)	4,995,315	(1)	5,380,551
Clutch facing and lining—number	1,182,728	927,597	1,160,166	910,820
Construction materials—short tons	16,395	3,055,227	19,076	3,749,659
Pipe covering and cement—do	3,040	806,976	2,262	737,666
Textiles, yarn, and packing—do	1,210	2,605,656	1,206	2,785,596
Manufactures, n. e. c.	(2)	430,146	(2)	607,017
Total products		12,820,917		14,171,309

[1] Owing to changes in classification, values have been summarized, quantities not shown.
[2] Quantity not recorded.

TECHNOLOGY

The use of asbestos in plastics is increasing. It was estimated that use in such products in 1956 had reached 14,000 tons per year of fibers ranging from group 4 to floats.[5]

A report on possible substitutes for amosite asbestos was made by the National Academy of Sciences in 1956 in connection with studies

[5] Badollet, M. S., and Ximenez, M. R., The Role of Asbestos in Plastics: Canadian Min. and Met. Bull., vol. 49, No. 531, July 1956, pp. 485–490.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/7

by the asbestos subcommittee of the Interdepartmental Materials Advisory Board.[6]

New methods of milling asbestos were being developed in South Africa. One process in use at Shabani, Southern Rhodesia, was said to have so improved the quality of the fiber and reduced the cost of operation that some abandoned mines could be reopened and worked profitably.

It was claimed that another new process developed by The Star Asbestos Co. in Eastern Transvaal prepared fibers in exceptionally uniform grades. Plans were underway to increase the capacity of the mill from 300 to 600 tons of fibers per month.[7]

The physical and chemical properties of chrysotile have a definite relation to its usability. Accordingly, research on the structure of the mineral may afford some clue to the variations in properties encountered and their significance in utilization. The Department of Mines and Technical Surveys, Ottawa, Canada, made pyrolysis studies of chrysotile in an effort to obtain more complete information on the structure and properties of the mineral (pyrolysis is defined as chemical decomposition by the action of heat). It was found that the thermal decomposition of chrysotile occurs in 3 stages; in the second, at a temperature range of 400° to 500° C., a greater part of the water of crystallization is expelled. Details of the research were published.[8]

Several patents appearing in 1956 related to the separation of asbestos fiber from barren material. They include new types of screens, equipment for separation of fiber from rock with minimum breakage of fiber, and methods of recovering asbestos fiber from waste.[9]

The filtering properties, as well as the fire resistance of asbestos, are utilized in developing new types of smoke filters for cigarettes and pipes.[10]

New types of thermal, sound, and electric insulating asbestos products were patented.[11]

[6] National Research Council, Report on Substitutes for Amosite Asbestos by the Panel on Substitutes for Amosite Asbestos of the Materials Advisory Board: Rept. MAB-112C, Oct. 1, 1956, 11 pp.

[7] South African Mining and Engineering Journal, vol. 67, No. 3328, Nov. 23, 1956, p. 865; No. 3332, Dec. 21, 1956, p. 1055.

[8] Woodrooffe, H. M., Pyrolysis of Chrysotile Asbestos Fibers: Canadian Min. and Met. Bull., vol. 49, No. 533, September 1956, pp. 623–628.

[9] Weston, D., Method and Apparatus for Screening Materials: U. S. Patent 2,775,347, Dec. 25, 1956.

Denovan, J. J., and Denovan, R. A. (assigned to Hall Machinery of Canada, Ltd., Sherbrooke, Que., Canada), Separatory Apparatus for Concentrating Asbestos Fibers: U. S. Patent 2,739,708, Mar. 27, 1956.

Kennedy, J. E., Method of Reclaiming Fibrous Material from Waste Dumps: U. S. Patent 2,743,012, Apr. 24, 1956.

Rescheneder, Karl (assigned to Eternit-Werke Ludwig Hatschek), Separating Talc From Asbestos: U. S Patent 2,748,935, June 5, 1956.

[10] Florinan, F., Chlorophyl Impregnated Filter Means for Tobacco Products: U. S. Patent 2,774,354, Dec. 18, 1956.

Schur, M. O., and Levy, R. M. (assigned to Ecusta Paper Corp., a corporation of Delaware), Cigarette Paper Wrapper: U. S. Patent 2,733,720, Feb. 7, 1956.

Knudson, H. W. (assigned to H. V. Specialties Co., Inc., East Walpole, Mass., and P. Lorillard Co., New York, N. Y.), Filter for Tobacco Smoke: U. S. Patent 2,761,798, Sept. 4, 1956.

[11] Hooks, R. M. (assigned to Southwestern Petroleum Co., Inc., Fort Worth, Tex.), Fire-Resistant Protective Coating: U. S. Patent 2,734,827, Feb. 14, 1956.

Seipt, W. R. (assigned to Keasbey & Mattison Co., Ambler, Pa.), Method for the Manufacture of Calcium Silicate Type Insulation: U. S. Patent 2,766,131, Oct. 9, 1956.

Doorman, L. M., Method to Insulate Compartments and Maintain a Uniform Temperature in Automobiles and Other Transports: U. S. Patent 2,768,672, Oct. 30, 1956.

Waggner, J. H. (assigned to Owens-Corning Fiberglas Corp., a corporation of Delaware), Fibrous Structures and Methods of Manufacturing Same: U. S. Patent 2,772,603, Dec. 4, 1956.

Cryor, R. E., Unit Heat Insulation for Pipes: U. S. Patent 2,758,043, Aug. 7, 1956.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/8

Several patents related to asbestos sheet and gasket materials, including certain mortar products.[12]

Either asbestos or mineral wool is used in new types of clutch facings and brake linings.[13]

Chrysotile asbestos is an essential component of a new type of drilling fluid especially suited for use under high-temperature well conditions.[14]

Asbestos is used in making a new type of fibrous liners for molds.[15]

WORLD REVIEW

World production of asbestos in 1956 was estimated to be nearly the same as in 1955. Production in Canada and the United States decreased nearly 5 percent but was offset by increases in other sections of the world.

NORTH AMERICA

Canada.—In May 1956 a contract was let by Lake Asbestos of Quebec, Ltd., a subsidiary of American Smelting & Refining Co., for constructing a mill having a capacity of 5,000 tons of rock per day at a cost of $7.7 million. Completion of the mill is expected early in 1958, and an output of 100,000 tons of asbestos per year is forecast. The deposit underlies Black Lake, from which silt was being removed at a rate of about 1 million cubic yards per month.[16]

The Canadian Johns-Manville Co. operation at Asbestos, Quebec, already the largest asbestos mill in the world, was being enlarged to provide additional floorspace of 75,000 square feet.

National Asbestos Mines, Ltd., a subsidiary of National Gypsum Co., made plans to mine and mill asbestos on a 500-acre tract acquired in part from Bell Asbestos Mines. The tract adjoins the Bell property. Production is expected in 1958.[17]

TABLE 9.—World production of asbestos by countries,[1] 1947–51 (average) and 1952–56, in short tons [2]

[Compiled by Helen L. Hunt and Berenice B. Mitchell]

Country [1]	1947–51 (average)	1952	1953	1954	1955	1956
North America:						
Canada (sales) [3]	760,408	929,339	911,226	924,116	1,063,802	1,014,229
United States (sold or used by producers)	39,719	53,864	54,456	47,621	44,580	41,312
Total	800,127	983,203	965,682	971,737	1,108,382	1,055,541

See footnotes at end of table.

[12] Barnet, I. (assigned to Johns-Manville Corp., New York, N. Y.), Making a Dyed-Flameproof Fabric: U. S. Patent 2,755,534, July 24, 1956.
Feigley, D. A., Jr. (assigned to Armstrong Cork Co., Lancaster, Pa.), Beater Saturation of Asbestos Fibers: U. S. Patent 2,759,813, Aug. 21, 1956.
Poltorak, E. J. (assigned to Johns-Manville Corp., New York, N. Y.), Gaskets: U. S. Patent 2,766,055, Oct. 9, 1956.
Burney, H. P., Jr., and Felder, J. L., Cement-Mortar Composition of Matter: U. S. Patent 2,763,561, Sept. 18, 1956.

[13] Almen, J. O., and Carnegie, W. L. (assigned to General Motors Corp., Detroit, Mich.), Clutch With Porous Compressible Friction Linings: U. S. Patent 2,733,797, Feb. 7, 1956. Composite Wet Clutch, U. S. Patent 2,733,798, Feb. 7, 1956.

[14] Rowe, D. A. (assigned to Sun Oil Co., Philadelphia, Pa.), Drilling Fluid: U. S. Patent 2,732,343, Jan. 24, 1956.

[15] Brennan, J. B., Method of Making Mold With Fibrous Liner: U. S. Patent 2,757,426, Aug. 7, 1956.

[16] Skillings' Mining Review, Contract Let for Asbestos Mill Construction by Lake Asbestos of Quebec, Ltd.: Vol. 45, No. 8, May 26, 1956, p. 4.

[17] Northern Miner, New Asbestos Mine for Thetford Area: Vol. 42, No. 1, Mar. 29, 1956, p. 21.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/9

TABLE 9.—World production of asbestos by countries,[1] 1947–51 (average) and 1952–56, in short tons[2]—Continued

Country[1]	1947–51 (average)	1952	1953	1954	1955	1956
South America:						
Argentina	287	(4)	(4)	(4)	198	50
Bolivia (exports)	209	513	810	33		62
Brazil	1,700	1,439	1,357	2,816	3,124	[5] 3,300
Chile	277	(4)	(4)	(4)	(4)	(4)
Venezuela	237	434	185	743	1,757	5,820
Total	2,710	[5] 2,800	[5] 2,800	[5] 4,000	[5] 5,300	[5] 9,500
Europe:						
Bulgaria	(4)	(4)	992	1,213	1,323	(4)
Finland [6]	11,123	11,464	12,047	7,853	18,674	8,282
France	3,942	8,338	11,419	14,449	10,913	9,370
Greece	26	26	1	6	3	6
Italy	18,687	26,387	22,484	25,955	33,266	36,459
Portugal	259	185	105	30	56	[5] 55
Spain	34	33		176		
U. S. S. R.[5]	205,000	240,000	240,000	240,000	240,000	240,000
Yugoslavia	1,025	2,762	4,131	3,598	4,305	4,165
Total [1 5]	245,000	290,000	290,000	300,000	310,000	305,000
Asia:						
Cyprus	13,145	18,250	15,966	17,146	17,143	[7] 14,005
India	249	969	805	435	1,564	1,343
Iran [8]		55			110	39
Japan	5,744	3,370	4,495	6,916	6,932	9,914
Korea, Republic of	(4)	(4)		233	66	54
Taiwan (Formosa)	290	26		163	405	118
Turkey	226			50	259	176
Total [1 5]	20,600	25,000	27,000	33,000	38,000	37,000
Africa:						
Bechuanaland		528	548	729	1,426	1,356
Egypt	940	66	220			
French Morocco	602	635	600	597	631	379
Kenya	532	390	166	224	152	170
Madagascar	4	3	8			
Mozambique				196	301	202
Rhodesia and Nyasaland, Federation of: Southern Rhodesia	70,328	84,834	87,739	79,962	105,261	118,973
Swaziland	32,397	34,769	30,104	30,142	32,613	29,875
Uganda				7	2	2
Union of South Africa	68,315	133,839	94,817	109,151	119,699	136,520
Total	173,118	255,064	214,202	221,008	260,085	287,477
Oceania:						
Australia	1,909	4,546	5,567	5,279	5,993	9,857
New Zealand	192	764			172	368
Total	2,101	5,310	5,567	5,279	6,165	10,225
World total (estimate)[1]	1,245,000	1,560,000	1,505,000	1,535,000	1,730,000	1,705,000

[1] In addition to countries listed, asbestos is produced in China, Czechoslovakia, and North Korea. Estimates by author of chapter are included in total.
[2] This table incorporates a number of revisions of data published in previous Asbestos chapters. Data do not add to totals shown owing to rounding where estimated figures are included in detail.
[3] Exclusive of sand, gravel and stone (waste rock only), production of which is reported as follows: 1947–51 (average), 34,167 tons; 1952, 39,664 tons; 1953, 21,118 tons; 1954, 26,429 tons; 1955, 28,582 tons; 1956, 45,428 tons.
[4] Data not available; estimate by author of chapter included in total.
[5] Estimate.
[6] Includes asbestos flour.
[7] Exports.
[8] Year ended March 20 of year following that stated.

The holdings of Dominion Asbestos Mines in Ham Township, Quebec, were surrendered to National Gypsum Co. which held a mortgage against the assets.[18]

[18] Northern Miner, Dominion Asbestos Drops Interest in Asbestos Field: Vol. 42, No. 23, Aug. 30, 1956, p. 2.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/10

Eastern Asbestos Co. continued exploratory work on its property in Portland West Township, north of Buckingham, Quebec, and found a new fiber zone in the north crosscut. Plans were made early in 1956 to construct a mill having a capacity of about 300 tons of rock per day on the property.

Metro Asbestos Processors, Ltd., built a mill having a capacity of 300 tons of rock per day on its property in Deloro Township, 5 miles southwest of South Porcupine, Ontario. A large deposit of good-quality asbestos was reported.

Advocate Mines reported a major asbestos discovery near Baie Verte between White Bay and Notre Dame Bay on the north coast of Newfoundland. Brief notes concerning this discovery appeared in various publications and reports. It was reported that the fibers are of good quality, and that virtually all of them fall in the Group 4 and shorter grades.

TABLE 10.—Sales of asbestos in Canada 1955–56, by grades

[Dominion Bureau of Statistics]

Grades	1955			1956		
	Short tons	Value		Short tons	Value	
		Total	Average per ton		Total	Average per ton
Crudes No. 1, 2, and other	724	$610,830	$844	717	$692,677	$966
Milled Group:						
3	43,081	16,205,846	376	33,929	14,071,703	415
4	234,998	37,400,073	159	246,295	42,124,569	171
5	117,017	13,207,315	113	112,759	13,200,835	117
6	172,339	12,797,081	74	168,942	12,685,874	75
7	469,149	18,885,498	40	428,149	16,676,046	39
8	26,494	534,455	20	23,438	407,659	17
Total, all grades	1,063,802	99,641,098	94	1,014,229	99,859,363	98
Waste rock	28,582	34,553	1	45,428	52,507	1
Rock mined	17,696,357			21,921,774		
Rock milled	12,427,002			13,739,276		

Mining was begun a month earlier than expected at the Cassiar mine on McDame Mountain, British Columbia, in 1956; and the mill, which had a rated capacity of 500 tons of rock, was found capable of milling 750 or more tons per day. Consequently, output in 1956 reached more than 20,000 tons of fiber compared with about 15,000 tons in 1955.

EUROPE

Finland.—For many years Finland has been the leading world producer of anthophyllite asbestos. In addition, discovery of a high-quality chrysotile asbestos deposit was reported in Finnish Lapland in 1955.[19]

Greece.—According to a consular report from Athens dated May 1, 1956, the Kennecott Copper Corp. was negotiating with the Greek Government concerning large-scale exploration of an asbestos deposit about 30 miles south of Kozani in northern Greece. The company

[19] Bureau of Mines, Mineral Trade Notes: Vol. 42, No. 3, March 1956, p. 18.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/11

was said to be ready to invest $6 million to develop the property if satisfactory arrangements could be made. Work conducted by the Greek Institute for Geology and Subsurface Research revealed existence of a large asbestos deposit. Extensive exploratory core drilling was done, and erection of a pilot mill was planned.

AFRICA

Bechuanaland.—Production of chrysotile at the Moshanang mine about 40 miles northwest of Labatsi was increased. The value of output in 1955 was about £150,000 compared with £113,000 in 1954.

Southern Rhodesia.—The asbestos occurrence at the Ethel mine, Southern Rhodesia, was described in some detail. Mining and milling methods, statistics of production, and cost data were included.[20]

TABLE 11.—Asbestos produced in Southern Rhodesia, 1952–56

Year	Short tons	Value	Year	Short tons	Value
1952	84, 834	£6, 651, 975	1955	105, 261	£7, 051, 831
1953	87, 739	6, 542, 731	1956	118, 973	8, 524, 671
1954	79, 962	5, 922, 724			

Union of South Africa.—The crocidolite deposits of the Union and methods of mining them were described.[21]

The availability of crocidolite, extent of reserves, inherent properties of the mineral that adapt it for specialized uses, and its possible replacement by substitutes were discussed in some detail.[22]

TABLE 12.—Asbestos produced in the Union of South Africa, 1952–56, by varieties and sources, in short tons

Variety and source	1952	1953	1954	1955	1956
Amosite (Transvaal)	63, 280	38, 258	45, 922	50, 137	50, 097
Chrysotile (Transvaal)	24, 970	18, 840	19, 373	20, 535	24, 336
Blue (Transvaal)	20, 294	16, 824	15, 610	13, 964	14, 399
Blue (Cape)	24, 441	20, 883	28, 136	34, 878	47, 688
Anthophyllite (Transvaal)	854	12	110	185	----------
Total	133, 839	94, 817	109, 151	119, 699	136, 520

[20] Airey, N. M., Operations at the Ethel Asbestos Mine, Southern Rhodesia: Bull. Inst. Min. and Met., vol. 66, pt. 2, November 1956, pp. 26–37.
[21] Sinclair, W. E., The Kliphius Crocidolite Deposits: Bull. Inst. Min. and Met., vol. 66, pt. 3, December 1956, pp. 69–78.
[22] Sinclair, W. E., The Distribution of Crocidolite Asbestos: South African Min. and Eng. Jour., vol. 67 pt. 1, No. 3300, May 11, 1956, pp. 675, 677, 679.

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/12

TABLE 13.—Asbestos produced in and exported from the Union of South Africa, 1952–56

Year	Production (short tons)			Exports	
	Transvaal	Cape Province	Total	Short tons	Value
1952	109,398	24,441	133,839	106,576	£6,899,086
1953	73,934	20,883	94,817	71,791	4,158,476
1954	81,015	28,136	109,151	94,322	5,453,116
1955	84,821	34,878	119,699	114,056	6,697,352
1956	88,832	47,688	136,520	122,867	7,336,037

OCEANIA

Australia.—The crocidolite deposits at Wittenoom Gorge in the Hamersley Ranges, Western Australia, were described; the asbestos occurs in 2 nearly horizontal zones about 20 feet apart. A discussion of the mining and milling methods followed by Australian Blue Asbestos, Ltd., was included in the article.[23]

A new mine, which had been under development for 2 years, came into production late in 1954. As the proportion of fiber to rock was relatively high in this area, production costs were more favorable than in other areas. An increase in foreign demand for blue asbestos was encouraged by a downward trend in prices.

According to a press statement issued by the Minister of National Development April 29, 1956, the Commonwealth of Australia joined with the State of Western Australia in subsidizing blue asbestos production at Wittenoom, Western Australia. The subsidy amounted to £10 (about $22.10) per ton up to a limit of 6,000 tons for the period October 1, 1955, to September 30, 1956. The subsidy was in the interest of developing mineral resources and also involved strategic considerations.

Tasmania.—A recent report[24] described numerous asbestos deposits in Tasmania but stated that only the Beaconsfield and Zeehan regions promise commercial production. They appear to be capable of supporting enough small enterprises for the needs of the State.

[23] Broadhurst, C. H., Blue Asbestos Industry in Western Australia: Chem. Eng. and Min. Rev., vol. 49, No. 2, Nov. 15, 1956, pp. 37–40.
[24] Taylor, B. L., Asbestos in Tasmania: Geol. Survey, Miner. Res. No. 9, Dept. of Mines, Tasmania, 1955, 112 pp.

466818—58——15

Published by AsbestosClaims.Law
asbestosclaims.law/library/10995/13