

1972

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BUREAU OF MINES MINERALS YEARBOOK

Asbestos



UNITED STATES DEPARTMENT OF THE INTERIOR





UNITED STATES DEPARTMENT OF THE INTERIOR • Rogers C. B. Morton, Secretary

BUREAU OF MINES • Elbert F. Osborn, Director

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Asbestos

By Robert A. Clifton¹

Shipments of asbestos in the United States increased less than 1% but established another record high in 1972. There was no readily apparent single reason that could explain the increased demand for asbestos. Imports were 8% above 1971 levels.

The world's largest producer, Canada, increased shipments to its largest market, the United States, by 10%; its total shipments were 3% over the 1971 total.

Legislation and Government Programs.—The Environmental Protection Agency (EPA) had not published its asbestos emission standards by yearend, but their

latest proposal recognized the adequacy of Bureau of Mines controls in mines and mills and would only control visible emissions from mill effluent gases. In 1972 the General Services Administration (GSA) reduced government inventories by disposing of 1,040 short tons of amosite, 11,478 tons of crocidolite, and 656 tons of chrysotile. The strategic grades of asbestos formerly under the Rhodesian Sanctions began to appear again on the U.S. market.

¹ Chemist, Division of Nonmetallic Minerals.

Table 1.—Salient asbestos statistics

	1968	1969	1970	1971	1972
United States:					
Production (sales).....short tons...	120,690	125,934	125,314	130,832	131,668
Value.....thousands.....	\$10,406	\$10,648	\$10,696	\$12,174	\$13,409
Exports and reexports					
(unmanufactured).....short tons...	41,236	38,173	46,585	53,678	58,624
Value.....thousands.....	14,679	14,979	16,996	17,863	19,051
Exports and reexports of asbestos					
products (value).....thousands.....	224,327	228,183	225,391	231,420	232,110
Imports (or consumption					
(unmanufactured).....short tons...	737,908	694,553	649,402	687,357	735,516
Value.....thousands.....	\$72,396	\$78,422	\$75,146	\$80,090	\$87,722
Consumption, apparent:					
short tons.....	817,363	732,727	725,131	738,571	808,554
World: Production.....thousands.....	3,315,301	3,599,123	3,861,251	3,961,373	4,083,340

¹ Measured by quantity produced, plus imports, minus exports.

Table 2.—Stockpile objective and Government inventories as of October 31, 1972
(Short tons)

Mineral	Stockpile objective	Inventories			Total
		National	Supplemental	Defense Production Act	
Amosite.....	18,400	11,705	46,898	--	58,598
Chrysotile.....	13,700	6,979	5,916	242	12,237
Subsidiaries.....	--	20	1,032	242	1,294
Crocidolite.....	None	1,564	23,390	--	25,444

Environmental Impact.—The expected effects of environmental regulations on the asbestos market were not apparent in 1972. The effect may just be postponed, because

the Office of Safety and Health Administration (OSHA) of the Department of Labor did not promulgate its regulations until June 7, 1972, and EPA had not pro-

mulgated its regulation by yearend. The OSHA Threshold Limit Value (TLV) retained its previous emergency value of five fibers greater than 5 micrometers in length per milliliter. The five fiber TLV is scheduled for reduction to two fibers in 1976. This schedule might be shortened if union and activist pressures continue.

The final prepublication proposals for EPA regulations differed greatly from the originals as far as asbestos mining was

concerned. The mines were omitted entirely as not needing EPA regulation, and the only standard applicable to mills pertained to "visible emissions to the outside air."

Some States, having written acceptable regulations, are now the environmental control regulating agency, with their regulations superseding, at least partially, those of the Bureau of Mines, OSHA and EPA.

DOMESTIC PRODUCTION

U.S. mines shipped less than 1% more asbestos in 1972 than in 1971. The value increased 10%. Four States produced asbestos: California, with 69%, was the leader, followed in order by Vermont, Arizona, and North Carolina.

The California segment of the asbestos industry continued to grow, with a 4% increase in production to 90,967 tons, and was led by the Pacific Asbestos Corp. mine in Calaveras County. The largest producing County was Fresno, with the Coalinga Asbestos Co., Inc. and Atlas Asbestos Corp. mines. Union Carbide Corp. had significant

production in San Benito County. The State's increased production realized an \$867,229 increase in value.

The GAF Corp. mine in Orleans County, Vt., remained the U.S. asbestos mine with the highest production and highest product value. With only the Jaquays Mining Corp. mine in Gila County operating again in 1972, Arizona production increased 2%. The production in North Carolina of Powhatan Mining Co. declined another 14% in 1972. U.S. asbestos producers and mine sites are as follows:

State and company	County	Name of mine	Type of asbestos
Arizona: Jaquays Mining Corp.	Gila	Chrysotile	Chrysotile
California:			
Atlas Asbestos Corp.	Fresno	Santa Cruz	Do.
Coalinga Asbestos Co., Inc.	do.	Christie	Do.
Pacific Asbestos Corp.	Calaveras	Pacific Asbestos	Do.
Union Carbide Corp.	San Benito	Santa Rita	Do.
North Carolina:			
Powhatan Mining Co.	Yancey	Hippy	Anthophyllite
Do.	Jackson	Boot Hill	Do.
Vermont: GAF Corp.	Orleans	Lowell	Chrysotile

ASBESTOS

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Table 8.—Asbestos production and consumption

Year	Number of mines	Production		Imports		% of consumption	Exports (short tons)	Apparent consumption (short tons)
		Quantity (short tons)	Value	Quantity (short tons)	Value			
1976	---	---	---	NA	114	NA	---	NA
1977	---	---	---	NA	162	NA	---	NA
1978	---	---	---	NA	4,700	NA	---	NA
1979	---	---	---	NA	6,486	NA	---	NA
1980	---	---	---	NA	1,871	NA	---	NA
1981	---	---	---	NA	8,638	NA	---	NA
1982	---	---	---	NA	9,204	NA	---	NA
1983	---	---	---	149	9,736	866	---	48
1984	---	---	---	1,160	21,717	66	---	800
1985	---	---	---	1,426	16,235	66	---	628
1986	---	---	---	1,234	16,235	66	---	484
1987	---	---	---	1,888	21,809	72	---	1,486
1988	---	---	---	1,789	48,766	64	---	1,789
1989	---	---	---	11,262	78,024	61	---	1,662
1990	---	---	---	12,237	181,193	60	---	2,437
1991	---	---	---	12,863	140,264	59	---	2,018
1992	---	---	---	12,803	168,584	49	---	2,007
1993	---	---	---	12,832	253,239	70	---	2,862
1994	---	---	---	11,978	262,567	87	---	2,044
1995	---	---	---	18,214	262,567	87	---	2,810
1996	---	---	---	14,101	282,438	84	---	2,209
1997	---	---	---	13,468	178,602	48	---	1,708
1998	---	---	---	14,864	240,029	65	---	2,953
1999	---	---	---	16,861	226,147	42	---	2,166
2000	---	---	---	16,846	239,044	45	---	7,008
2001	---	---	---	(1)	203,440	---	---	---
2002	---	---	---	(1)	287,436	---	---	---
2003	---	---	---	(1)	305,119	---	---	---
2004	---	---	---	(1)	331,786	---	---	---
2005	---	---	---	(1)	641,081	---	---	---
2006	---	---	---	(1)	729,424	---	---	---
2007	---	---	---	(1)	651,269	---	---	---
2008	---	---	---	(1)	708,572	---	---	---
2009	---	---	---	26,781	178,462	28	---	29,870
2010	---	---	---	20,620	1,076,464	38	---	82,816
2011	---	---	---	21,608	1,104,109	40	---	27,891
2012	---	---	---	28,114	1,068,322	36	---	28,710
2013	---	---	---	27,691	893,278	36	---	30,434
2014	---	---	---	63,231	1,122,066	21	---	56,804
2015	---	---	---	68,979	1,018,839	21	---	71,838
2016	---	---	---	71,628	1,468,012	20	---	76,828
2017	---	---	---	64,787	1,028,705	22	---	81,887
2018	---	---	---	71,666	1,407,168	20	---	96,237
2019	---	---	---	63,568	1,081,488	21	---	78,113
2020	---	---	---	114,162	8,301,470	28	---	117,841
2021	---	---	---	134,008	4,521,122	34	---	146,068
2022	---	---	---	133,700	6,383,866	46	---	137,808

See footnotes at end of table.

Table 3.—Asbestos production and consumption—Continued

Year	Number of mines	Production			Imports			% of consumption	Exports (short tons)	Apparent consumption (short tons)
		Quantity (short tons)	Value	Unit value	Quantity (short tons)	Value	Unit value			
1918	12	1,781	9248,266	5214	185,270	97,859,885	524	100	1,110	185,912
1919	14	1,818	660,811	364	187,656	9,120,253	54	98	---	170,654
1920	9	831	882,858	406	12,468	2,946,802	41	99	---	78,294
1921	9	87	10,120	151	149,427	5,144,700	34	100	878	149,118
1922	8	227	9,428	42	212,420	7,446,143	35	100	680	211,647
1923	10	800	42,628	142	183,260	5,402,345	31	100	1,270	182,280
1924	7	1,268	61,700	41	230,620	7,184,802	31	100	1,109	230,689
1925	6	1,868	181,781	94	267,621	4,142,605	32	100	1,104	267,878
1926	7	2,381	330,882	118	223,693	8,169,848	34	100	808	228,365
1927	6	2,280	351,178	154	230,595	8,019,891	39	99	850	231,984
1928	11	3,155	561,004	181	282,827	11,163,017	42	99	709	244,678
1929	8	4,242	289,284	68	208,681	7,064,824	34	99	771	212,162
1930	10	8,228	118,967	14	136,381	8,748,440	27	90	1,744	137,878
1931	10	8,668	108,292	13	94,764	2,260,200	23	98	1,707	98,608
1932	6	4,746	130,477	28	119,494	8,640,375	30	97	1,878	122,661
1933	6	4,087	168,847	41	120,634	8,877,984	31	97	1,639	123,753
1934	7	8,920	292,921	33	164,685	8,126,418	31	95	560	174,453
1935	10	11,064	311,161	28	243,602	7,624,937	31	97	8,744	260,870
1936	10	12,079	341,444	29	307,581	10,470,208	34	97	8,001	316,263
1937	4	10,440	217,244	21	179,490	4,160,402	34	96	2,780	187,160
1938	12	18,460	517,768	34	242,661	8,034,538	37	96	2,478	266,647
1939	15	20,060	711,608	36	248,615	10,034,433	41	94	4,074	262,199
1940	17	24,801	728,763	30	419,448	17,918,268	48	98	4,848	438,991
1941	11	16,481	498,867	32	419,242	21,217,600	61	97	774	483,949
1942	11	6,014	334,848	56	440,266	28,063,624	62	99	864	446,905
1943	11	4,857	880,834	57	400,968	18,562,840	48	98	476	407,148
1944	8	12,224	417,848	34	374,198	16,284,816	44	99	8,560	371,676
1945	11	14,078	604,784	38	466,688	18,731,378	41	99	11,011	463,762
1946	10	24,036	918,668	38	624,639	29,821,519	69	98	2,087	616,187
1947	17	37,092	1,806,281	49	417,681	37,974,092	69	96	6,530	678,443
1948	9	48,887	2,414,414	60	616,803	33,939,982	66	97	20,045	532,708
1949	16	42,434	2,926,060	69	705,468	47,284,205	67	97	20,690	727,002
1950	16	61,646	8,912,800	74	781,878	58,621,048	71	94	18,524	784,892
1951	18	53,844	4,713,032	87	709,419	41,526,900	87	94	10,724	762,552
1952	13	54,464	4,767,848	89	692,246	39,763,183	84	93	9,076	715,626
1953	21	47,821	4,607,382	89	678,390	35,866,808	82	91	1,894	721,117
1954	17	48,580	4,487,446	101	740,428	60,867,878	82	96	2,787	782,218
1955	18	41,812	4,742,446	118	889,034	81,829,276	90	96	2,860	727,898
1956	16	48,968	4,917,648	113	682,782	60,193,816	88	94	2,893	723,492
1957	13	43,979	4,127,000	117	644,531	66,814,000	91	96	8,028	686,284
1958	12	45,469	4,991,000	97	718,047	66,006,000	91	96	4,481	764,046
1959	14	46,228	4,281,000	94	669,406	63,846,000	94	98	6,525	709,193
1960	12	53,514	4,947,000	82	618,629	58,942,000	98	98	8,799	685,544
1961	15	58,190	4,672,000	88	474,027	44,160,000	86	98	2,949	724,268
1962	11	66,804	5,426,000	81	487,860	41,789,000	92	92	10,044	734,432

1964	12	101,092	8,149,000	51	739,861	72,879,000	98	27,147	613,806
1965	12	119,275	10,142,000	88	719,659	70,467,000	98	41,124	784,408
1966	10	125,928	11,053,000	88	724,459	78,100,000	101	46,998	806,491
1967	9	123,189	11,502,000	90	845,112	65,719,000	102	47,218	720,682
1968	9	120,690	10,408,000	88	737,900	72,900,000	99	41,256	817,868
1969	9	128,086	10,618,000	86	694,668	78,422,000	110	38,179	781,321
1970	10	128,814	10,699,000	86	849,402	78,148,000	116	48,666	728,181
1971	9	130,682	12,174,000	98	881,887	80,090,000	118	55,658	786,471
1972	8	131,648	18,409,000	102	785,615	67,732,000	119	58,624	808,864

NA Not available.

(Estimated by assigning Canadian values to all imports.

(Canadian shipment values.

(During these years Canadian production figures and values included "Autoptic" (tailings and short fibers), making extraction of an average fiber value impossible.

CONSUMPTION AND USES

In the 100th year of commercial asbestos use in the United States, some new definitive data on consumption have been collected. These data, because they were collected on a greatly revised form from an expanded list of consumers, bear no relationship to the estimates of previous years, and comparisons are inappropriate. They are shown in table 3. The chrysotile data in the table have been adjusted to reflect 95% of the apparent consumption. The other data are presented as reported.

It is no surprise that with a few thousand known end uses, 15% of consumption falls into minor categories or "Other." The eight major uses are construction 42%, floor tile 11%, friction products 10%, paper 9%, asphalt felts 6%, packing and gaskets 4%, insulation 2%, and textiles 1%.

Analysis of the newly available data on U.S. consumption of asbestos will be facilitated by some rather arbitrary combination of chrysotile grades. Table 4 shows these combinations, which disregard chemical variances, strength, electrical properties, and other differences other than uses based loosely on the Quebec Asbestos Mining Association standards.

Crudes, and Groups 1, 2, while not milled, have the same ultimate textile uses as Group 3, and are combined as BM I (spinning). Groups 4 and 5 comprise BM II (shingle and paper). Groups 6 and 7 become BM III (shorts).

Note that the spinning grades (BM I) are found only in four of the major uses. These fibers comprised 3% of the reported tonnages. Shingle and paper grades (BM II) were 47% of the weight of the fibers reported and were in all the major uses but textiles. The remainder, 50% of the reported fibers, were shorts (BM III) and were found in every major use.

The construction field used 24% of the anthophyllite reported, and friction products used 29%. These were the only major uses reported, except for a tiny amount in textiles.

Seventy-two percent of the amosite reported was used for insulation, 18% for construction, and 6% for asphalt felts.

Construction accounted for 88% of the crocidolite and paper for 1%.

Overall consumption in 1972 increased nearly 7% over that of 1971, with no usage trends apparent.

Table 4.—Bureau of Mines chrysotile groupings

BM I (spinning)	BM II (shingle and paper)	BM III (shorts)
CANADA		
Group 1 (crude) Group 2 (crude) Group 3 AAA, AA, A, AC, CC	Group 4 Group 5 AK, CT, AS, CT, AT, CT, AY	Group 6 Group 7
ARIZONA		
No. 1 Crude No. 2 Crude AAA	Group No. 3, Group No. 4 Group No. 5	Group No. 6 Group No. 7
CALIFORNIA		
	Grade 4, Grade 5	Grade 6, Grade 7
VERMONT		
Grade 3	Grade 4, Grade 5	Grade 6, Grade 7, Grade 8

Table 3.—U.S. asbestos consumption 1972

(Short tons)

End use	Chrysotile (adjusted)				Anthophyllite (reported)	Amosite (reported)	Crocidolite (reported)
	BM I	BM II	BM III	Total			
Construction.....	--	214,300	108,500	322,800	218	1,017	13,795
Floor tile.....	--	4,700	80,000	84,700	--	--	--
Friction products.....	5,400	24,000	47,600	77,000	252	--	--
Paper.....	--	2,100	67,200	69,300	--	--	150
Asphalt felts.....	--	17,000	29,200	46,200	--	351	--
Packing and gaskets.....	2,000	18,000	10,800	30,800	--	--	24
Insulation.....	2,500	2,300	10,500	15,400	--	4,131	--
Textiles.....	7,600	--	7,100	14,700	3	--	20
Other.....	1,000	80,500	33,700	115,200	420	208	1,525
Total.....	18,500	363,700	387,700	770,000	908	5,706	15,625

PRICES

Quoted prices for Quebec asbestos in 1972 were unchanged since July 1, 1971. On January 1, 1973, British Columbia spinning grades were to rise 2% and cement grades 5%. The price of Arizona asbestos was expected to remain unchanged.

Prices for Arizona chrysotile asbestos have remained unchanged since August 1, 1968. Quotations, f.o.b. Globe, were as follows:

Grade	Description	Per short ton
Group 1...	Crude.....	\$1,410-\$1,650
Group 2...	do.....	700- 950
AAA.....	do.....	800
Group 3...	Nonferrous filtering and spinning.....	425- 700
Group 4...	Nonferrous plastic and filtering.....	400- 500
Group 5...	Plastic and filtering.....	385- 425
Group 6...	Refuse or shorts.....	250
Group 7...	do.....	65- 90

As of January 3, 1973, Vermont Chrysotile asbestos, f.o.b. Morrisville, was priced as follows:

Grade	Description	Per short ton
Grade 4...	Shingle fiber.....	\$218.00-\$371.00
Grade 5...	Paper fiber.....	157.50- 185.00
Grade 6...	Waste, sludge, or plaster fiber.....	114.00
Grade 7...	Shorts and dusts.....	43.50- 95.00

Quotations for Canadian (Quebec) chrysotile, f.o.b. mine, were as follows, as of July 1, 1971:

Grade	Description	Per short ton
Group 1...	Crude.....	Can \$1,615
Group 2...	do.....	875
Group 3...	Spinning fiber.....	412-675
Group 4...	Shingle fiber.....	227-385
Group 5...	Paper fiber.....	164-196
Group 6...	Waste, sludge, or plaster.....	120
Group 7...	Refuse or shorts.....	52-100

The increased demand for asbestos used in cement products (groups 5, 7) resulted in greater price increases in these categories. The last price rise for British Columbia emphasizes this point.²

Prices for British Columbia, Canada, chrysotile asbestos, f.o.b. Vancouver, will rise January 1, 1973 to the following:

Grade	Description	Per short ton
AAA.....	Nonferrous spinning fiber.....	Can \$396
AA.....	do.....	711
A.....	do.....	541
AC.....	Asbestos cement fiber.....	388
AE.....	Shingle fiber.....	276
CP.....	do.....	281
AS.....	do.....	240
CT.....	do.....	235
AX.....	do.....	219
CY.....	do.....	155
AY.....	do.....	166

Privately negotiated sales are typical of the African asbestos producers. As this rules out market quotations, the following figures are averages, regardless of grade, of the values of South African imports calculated from U.S. Department of Commerce Data:

Type	Per short ton			
	1969	1970	1971	1972 ¹
Amosite.....	\$153	\$160	\$164	\$188
Crocidolite.....	189	196	212	222
Chrysotile.....	192	198	120	211

¹ First 3-month data on imports, U.S. Bureau of the Census.

² Asbestos, V. 54, No. 7, January 1973, p. 36.

FOREIGN TRADE

The value of exports of asbestos products manufactured in the United States increased 2 percent over the value of those exported in 1971. Five of the nearly 100 countries buying these products accounted for better than 60% of the foreign sales. They were Canada (44%), West Germany (9%), the United Kingdom (4%), Venezuela (2%), and Australia (4%).

In 1972 the United States imported 91% of its asbestos needs. This bettered the

1971 percentage, because of increased demand. Canada provided 97% of the imports, the Republic of South Africa provided 2%, and nine other countries, 1%. Chrysotile, with 98%, dominated the imported types. There was a near 10% increase in the dollar value of imported fibers. The Rhodesian values in table 7 reflect the recent lifting of the 1967 embargo.

Table 6.—U.S. exports and reexports of asbestos and asbestos products

Product	1971		1972	
	Quantity	Value (thousands)	Quantity	Value (thousands)
EXPORTS				
Unmanufactured:				
Crude and spinning fibers.....short tons..	6,830	\$1,376	22,081	\$3,786
Nonspinning fibers.....do.....	21,257	3,453		
Waste and refuse.....do.....	24,116	2,742	29,711	3,828
Total.....do.....	52,202	7,571	51,792	7,621
Products:				
Gaskets and packing.....do.....	2,299	7,698	2,409	7,482
Brake linings.....do.....	5,258	7,186	4,496	6,654
Clutch facings, including linings.....number..	1,920,176	1,572	2,727,573	1,908
Textiles and yarn.....short tons..	6,673	3,397	8,643	4,863
Shingles and clapboard.....do.....	12,696	2,580	10,366	2,308
Articles of asbestos cement.....do.....	9,603	3,080	9,649	2,148
Manufactures, n.e.c.....do.....	NA	5,897	NA	6,715
Total.....do.....	--	31,409	--	32,058
REEXPORTS				
Unmanufactured:				
Crude and spinning fibers.....short tons..	1,141	229	6,287	1,367
Nonspinning fibers.....do.....	335	63		
Waste and refuse.....do.....	--	--	545	63
Total.....do.....	1,476	292	6,832	1,430
Products:				
Gaskets and packing.....do.....	1	5	254	11
Brake linings.....do.....	6	10	--	--
Clutch facings, including linings.....number..	422	1	--	--
Textiles and yarn.....short tons..	--	--	5	12
Shingles and clapboard.....do.....	--	--	--	--
Articles of asbestos cement.....do.....	--	--	100	23
Manufactures, n.e.c.....do.....	NA	5	NA	--
Total.....do.....	--	21	--	52

* Revised. NA Not available.

Table 7.—U.S. imports for consumption of asbestos (unmanufactured), by class and country

Year and country	Crude (including blue fiber)		Textile fiber		All other		Total	
	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)
1971								
Canada.....	240	396	11,620	35,306	636,782	369,377	648,642	\$74,979
Finland.....	--	--	--	--	4,182	342	4,182	342
Italy.....	2	4	--	--	--	--	2	4
Mexico.....	--	--	18	8	40	3	58	11
Mozambique.....	203	43	--	--	167	31	360	74
South Africa.....	--	--	--	--	--	--	--	--
Republic of.....	23,188	4,104	1	(1)	1,822	399	25,011	4,503
Swaziland.....	160	46	--	--	230	59	390	105
United Kingdom.....	--	--	--	--	109	3	109	3
Yugoslavia.....	--	--	--	--	2,613	69	2,613	69
Total.....	23,793	4,293	11,639	5,314	645,336	70,463	681,367	80,090
1972								
Bolivia.....	29	3	--	--	--	--	29	3
Canada.....	64	10	11,599	5,316	702,230	78,577	713,835	83,903
Finland.....	--	--	--	--	2,243	160	2,243	160
Greece.....	--	--	--	--	6	1	6	1
Italy.....	--	--	--	--	2	3	2	3
Mozambique.....	423	86	--	--	597	118	1,025	203
Rhodesia, Southern.....	200	99	--	--	--	--	200	99
South Africa.....	--	--	--	--	--	--	--	--
Republic of.....	14,938	3,066	18	7	1,481	220	16,385	3,233
Swaziland.....	40	21	--	--	--	--	40	21
Switzerland.....	--	--	--	--	4	1	4	1
Yugoslavia.....	--	--	843	12	843	43	1,686	56
Total.....	15,701	3,274	12,468	5,335	707,366	79,123	736,515	87,732

1 Less than 1/2 unit.

Table 3.—U.S. imports for consumption of asbestos from specified countries by grade
(Short tons)

Grade	1971		1972		
	Canada	Republic of South Africa	Canada	Southern Rhodesia	Republic of South Africa
Chrysotile:					
Crude	188	1,555	56	200	2,433
Spinning fibers	11,620	1	11,598	--	16
All other	536,782	1,822	702,230	--	1,481
Crocidolite (blue)	52	6,953	--	--	5,374
Amosite	--	14,580	--	--	7,125
Total	648,642	23,011	713,896	200	16,385

WORLD REVIEW

Trend analyses such as those shown in figure 1 can reveal a great deal about the changes becoming apparent in the world market. The data were derived by using all the information available for the last 10 years to establish trends by linear regression analysis. The full 10-year figures were available for the United States and Canada, and at least 4 years were available for each of the other countries.

If each of the major consuming countries kept a near-constant share of an expanding market, the result would be a straight line, as shown by Canada. The U.S.S.R. and Japan typify those countries whose consumption rate has increased faster than the world production rate. The United States and the United Kingdom have gone the opposite way.

The United States, with a remarkably stable consumption rate, is taking a smaller share of the expanding market, and it is apparent that it will soon be supplanted by the U.S.S.R. as the world's largest consumer, if this has not already happened.

The same kind of analysis of Canadian data can also be informative, as shown in figure 2. Canada is both the world's largest producer and exporter of asbestos, and a major consumer as well. The marked divergence of the value and production lines shows graphically the inflationary trends. The upward slope of the production and export lines is indicative of the expanding world market. The slight divergence between the production and export lines illustrates that Canada's consumption growth rate exceeds that of production and that an increasing amount of Canadian asbestos is being used domestically.

Australia.—The Woodreef mine and mill began operation in January 1972 and

had such promising prospects that its parent Canadian company (formerly Pacific Asbestos) is now officially Woodreef Minerals Ltd. There was an official dedication in April and the mill was approaching full capacity throughout by yearend. This capacity (70,000 tons per year fiber) is felt to be inadequate, and plans for doubling it by 1975 are underway.

Bolivia.—The 3-year United Nations Development Program (UNDP) to assist in establishing an asbestos industry at Cochabamba was terminated in 1972. UNDP called the project a success and thought the operation could function without further assistance.

Canada.—The world's largest producer rebounded from last year's drop in production with a 5% increase in 1972. There were notes of caution from some industry leaders saying that market expansion would proceed at a slower rate and that new markets and applications were essential to a healthy industry. These probably well-founded views, however, were offset by the scurry of activity at producing mines and at those with potentials. This activity hints at a more optimistic viewpoint. Examples of this are—

1. The expansion and modernization of the Canadian Johns-Manville Co., Ltd. mine and mill at Asbestos, Quebec, has not been curtailed. The project neared completion at yearend, and among the new facilities was the world's largest crusher. This 800-ton gyratory crusher can accept the full load of a 200-ton dump truck at one time.

2. The Asbestos Corp's new mine on the Ungava Peninsula went into production and started shipping concentrate to Nordheim, West Germany. Of real significance is the news that the tailings from

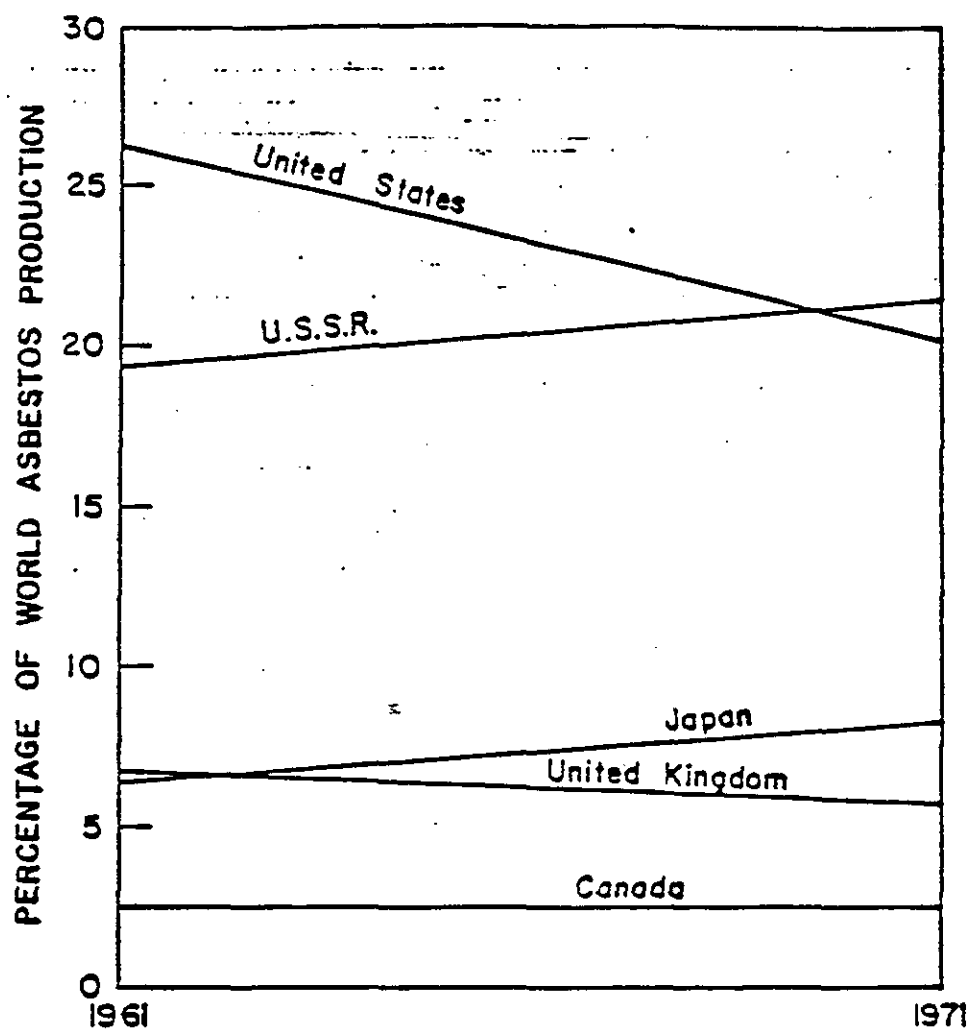


Figure 1.—National apparent consumption trends.

the Nordenheim plant are being used to make a marketable nonfired brick of good quality.

3. Abitibi Asbestos Mining Co., Ltd., has sold an 18% interest in its Amos, Quebec, deposit to Brinco, Ltd., which has an option on a further 33%. The \$2 million advanced by Brinco is being used to provide a 35-ton-per-day mill for pilot studies.

4. Pan Ocean Oil Corp. is negotiating with Pathfinder Resources Ltd. over the possible development of an asbestos ore body in Cleveland Township, Quebec.

5. Allied Mining Corp. is planning a merger with United Asbestos Corp. to fur-

ther the production plans for their Midlothian Township, Ontario, asbestos deposit.

New Zealand.—Kennecott Exploration Ltd., the New Zealand subsidiary of the U.S. company, has reportedly discovered a large asbestos property at Red Hills in West Otago on South Island.

Rhodesia Southern.—Undaunted by strikes early in the year, the Rhodesian and General Asbestos Corp. spent 25 million rand replacing the mill at their King mine. The first asbestos in several years was shipped to the United States.

Sudan.—A United Nations Development

Program survey of an asbestos deposit in the Ingenasa Hills has not yet been made public.

Swaziland.—The Government reached a new agreement with Turner & Newell Ltd.

in which a 20% interest in the Havelock asbestos mine would be transferred to the Government immediately without cost and another 20% would be bought from profits over 6 years.

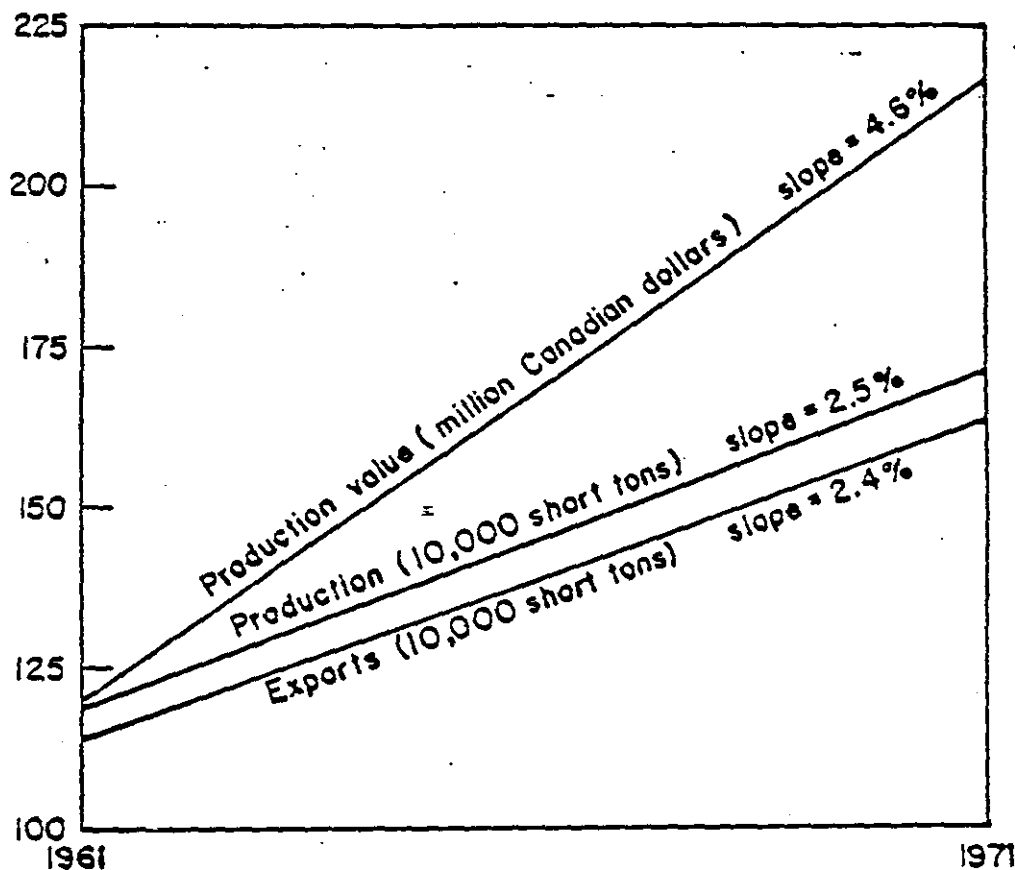


Figure 2.—Trends in Canadian asbestos.

Table 9.—Canada: Shipments¹ of asbestos, by grade
(Short tons)

	1968	1969	1970	1971	1972
Quebec milled group:					
BM I.....	32,248	29,291	24,648	21,572	21,538
BM II.....	529,253	530,354	563,647	519,621	508,970
BM III.....	800,509	783,562	779,229	801,427	847,289
Newfoundland, Ontario, British Columbia, and Yukon.....	147,389	233,669	234,120	292,342	309,522
Total.....	1,509,699	1,576,876	1,561,644	1,634,962	1,687,319

¹ Includes tonnage for own use.

Source: Dominion Bureau of Statistics.

Table 10.—Asbestos: World production, by country
(Short tons)

Country ¹	1970	1971	1972 ²
North America:			
Canada (sales).....	1,661,644	1,634,579	1,623,000
United States (sold or used by producers).....	125,314	130,882	131,662
Latin America:			
Argentina.....	39	433	* 440
Brazil ³	18,000	22,000	36,000
Europe:			
Bulgaria.....	3,307	* 3,300	* 3,300
Finland ⁴	15,019	11,420	7,042
France ⁵	550	550	550
Italy.....	130,663	131,801	146,675
Portugal.....	221	140	* 9
U.S.S.R. ⁶	1,175,000	1,270,000	1,346,000
Yugoslavia.....	13,342	17,011	12,170
Africa:			
Egypt, Arab Republic of.....	* 496	77	* 80
Mozambique.....	251	1,577	589
Rhodesia, Southern ⁷	88,000	88,000	88,000
South Africa, Republic of.....	* 320,020	355,223	354,204
Swaziland.....	36,439	39,114	36,817
Asia:			
China, People's Republic of ⁸	190,000	175,000	220,000
Cyprus.....	28,247	30,531	* 30,851
India.....	10,840	12,122	13,523
Japan.....	23,451	19,762	15,908
Korea, Republic of (South).....	1,513	--	2,155
Philippines.....	1,337	--	--
Taiwan.....	3,133	2,565	2,962
Turkey.....	* 3,809	4,281	* 4,400
Oceania: Australia.....	* 815	990	* 1,000
Total.....	* 3,851,251	3,951,373	4,083,340

* Estimate. * Preliminary. * Revised.

¹ In addition to the countries listed Czechoslovakia, North Korea and Romania also produce asbestos, but available information is inadequate to make reliable estimates of output levels.² Includes asbestos flour.³ Gross weight.⁴ Includes vermiculite.⁵ Exports only.