



2008 Minerals Yearbook

ASBESTOS

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Asbestos has not been mined in the United States since 2002, and imports, mostly from Canada, satisfied the needs of domestic consumers. U.S. apparent consumption declined to 1,460 metric tons (t) in 2008 from 1,730 t in 2007. World production was 2.09 million metric tons (Mt) in 2008, a decrease from 2.30 Mt in 2007.

Legislation and Government Programs

The Mine Safety and Health Administration issued a final asbestos rule, which reduced the 8-hour time-weighted average permissible exposure level to 0.1 fiber per cubic centimeter (f/cc) from 2.0 f/cc. The rule also set a limit of 1 f/cc for a 30-minute exposure for coal, metal, and nonmetal mining (Mine Safety and Health Administration, 2008).

In June, the National Institute of Occupational Safety and Health (NIOSH) issued a revision to the proposed strategic plan for asbestos health research. The plan outlined proposals for epidemiological studies, characterization of asbestos collected on air monitor filters from past industry monitoring, improvement of sampling analysis methods, a review of definitional issues related to asbestos, and health research on fiber-like cleavage fragments. The revision also proposed that the NIOSH study elongated particles, which were defined by NIOSH to be mineral and manmade particles that possessed a length-to-width ratio of 3:1 or more and had a length equal to or greater than 5 micrometers. Some of the elongated particles of interest to NIOSH were the asbestos varieties and their nonasbestiform analogs as well as attapulgite, erionite, and wollastonite (National Institute of Occupational Safety and Health, 2008).

The presence of asbestos in soil and exposed rock in residential and recreational areas continued to be an issue in the United States. In May, the U.S. Bureau of Land Management (BLM) temporarily closed about one-half of the 63,000-acre Clear Creek management area in California. The agency was concerned about the lifetime risk posed by exposure to airborne asbestos released from the soils during recreational activities. Access by the general public continued to be prohibited while the BLM developed a resource management plan. A deadline for the development of the plan was not announced (U.S. Bureau of Land Management, 2008).

The U.S. Geological Survey issued a map detailing reported historic asbestos mines, historic asbestos prospects, and natural asbestos occurrences in the southwestern United States. The map and dataset contain location, mineralogy, geology, and references to asbestos sites in Arizona, Nevada, and Utah (Van Gosen, 2008).

Consumption

U.S. consumption of asbestos was 1,460 t in 2008, a 16% decrease from 1,730 t in 2007 (table 1). Coating and

compounds accounted for 36% of U.S. consumption; roofing products, 34%; and other, 30%. Most of the asbestos reported under “coating and compounds” probably was used in roofing products. Consequently, roofing applications, which comprised bituminous roof coatings and roof sealants, accounted for 65% to 70% of the total U.S. asbestos end-use market (table 2).

Slightly more than 40% of the asbestos listed as grades 3 to 7 under “Other” in table 2 was used for manufacturing diaphragms for the chloralkali industry and gaskets. Most of the imported chrysotile, which was reported as “Other” under “Unspecified grade” in table 2, probably was used for manufacturing diaphragms for the chloralkali industry. Chrysotile was the only type of asbestos used in the United States in 2008, 64% of which was grade 7; the rest was grades 4, 5, and 3, in descending order of percentage. About 220 t of the “unspecified grade” in table 2 was grade 4 chrysotile according to U.S. International Trade Commission (ITC) statistics (U.S. International Trade Commission, 2009).

Prices

The average free alongside ship (f.a.s.) unit value of asbestos fiber exports and reexports was \$938 per metric ton in 2008, an increase from \$517 per ton in 2007 (table 4). The average U.S. customs unit value for all grades of imported asbestos increased to \$746 per ton in 2008 from \$473 per ton in 2007 (table 5). The average value of imported crude chrysotile, all from Canada, was \$700 per ton in 2008, an increase from \$175 per ton in 2007. The average unit value for imports of milled, grade 4 chrysotile was \$2,062 per ton in 2008, a decrease from \$2,167 per ton in 2007. The unit value of other grades of chrysotile was \$455 per ton in 2008, an increase from \$417 per ton in 2007. Unit values for chrysotile imported from South Africa and Zimbabwe were greater than equivalent grades of Canadian fiber (table 5).

Foreign Trade

The following section summarizes significant trade statistics on asbestos and products manufactured using asbestos. Detailed trade statistics, by country and individual U.S. port districts, are available from the ITC’s Interactive Tariff and Trade Dataweb Web site (U.S. International Trade Commission, 2009).

In 2008, U.S. exports of asbestos fiber were 368 t with an f.a.s. value of \$345,000, a decrease in tonnage from 815 t valued at \$421,000 in 2007. Asbestos has not been produced in the United States since 2002, thus reported exports probably consisted of reexports of imported fiber or improperly classified products (table 4). The United States exported \$33.2 million of asbestos products in 2008. Mexico was the leading importer, followed by Canada, China, and the Republic of Korea. These four countries accounted for 61% of the value of asbestos products exported from

the United States in 2008 (table 3). Friction products, including brake linings, clutch linings, and disk pads, accounted for 48% of the value of manufactured products exported in 2008 (table 4). Because no asbestos brake components under Harmonized Tariff Schedule of the United States (HTS) code 6813.20 or asbestos-cement products under HTS code 6811.40 are manufactured in the United States, the values for these two HTS code categories probably represent exports from stocks, reexports of asbestos products, or products incorrectly classified under the HTS codes.

In 2008, the United States imported 1,460 t of asbestos valued at \$1.09 million. Canada supplied 83% of the tonnage. Asbestos also was imported from South Africa and Zimbabwe (table 5). Imports from South Africa probably represented transshipments of chrysotile from Zimbabwe through South Africa. Only chrysotile was imported into the United States in 2007. Based on the import source, asbestos listed under “other, unspecified asbestos type” in table 5 probably represented chrysotile.

The United States also imported \$18.4 million of material with a basis of asbestos and products with a basis of asbestos and magnesium carbonate (U.S. International Trade Commission, 2009). Some nonasbestos products probably are included under the asbestos HTS codes based on reported asbestos imports from countries which have banned asbestos use (table 6).

World Review

World production of asbestos was estimated to be 2.09 Mt in 2008, a decrease from 2.30 Mt in 2007. China accounted for the bulk of the decrease in world production. Russia was the leading producer of asbestos, followed by China, Brazil, Kazakhstan, Canada, and Zimbabwe; Colombia reported crude ore production rather than fiber production. These six countries accounted for 96% of the world production (table 7).

The United Nations determined that chrysotile will not be added to the list of substances for which exporters must receive “prior informed consent” from importers. The decision was made at the Rotterdam Convention in October after the delegates did not arrive at a consensus on the issue (Chrysotile Institute, 2008). A ban on the use, manufacture, and processing and the export and import of asbestos and asbestos-containing materials (ACM) in South Africa became effective in March 2008. The ban allowed the continued use of ACM already in place, but new sales of asbestos or ACM were prohibited 120 days after the rule was implemented (Appel, 2008; Mail and Guardian Online, 2008).

Outlook

U.S. consumption probably will continue its slow decline as markets continue to weaken. World production remains greater than 2.0 Mt because of continued demand in many regions of the world despite many national bans on asbestos being instituted in the past 10 years. With more national bans being discussed, world consumption may be further concentrated in fewer regions of the world, and world production may begin to decline slightly.

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TABLE 1
SALIENT ASBESTOS STATISTICS¹

		2004	2005	2006	2007	2008
United States:						
Exports and reexports: ²						
Unmanufactured, value	thousands	\$333	\$398	\$866	\$421	\$345
Asbestos products, value ³	do.	\$341,000	\$374,000	\$443,000	\$29,200	\$33,200
Imports for consumption, unmanufactured:						
Quantity	metric tons	3,450	2,530	2,230	1,730	1,460
Value ⁴	thousands	\$806	\$1,420	\$1,000	\$819	\$1,090
Consumption, apparent ⁵	metric tons	3,450	2,530	2,230	1,730	1,460
World, production	do.	2,340,000 ^r	2,270,000 ^r	2,210,000 ^r	2,300,000 ^r	2,090,000

^rRevised. do. Ditto.

¹Data are rounded to no more than three significant digits.

²Free alongside ship value; includes exports of crudes, fibers, stucco, sand, and refuse.

³Product export data prior to 2007 also included nonasbestos products.

⁴U.S. customs declared value.

⁵Consumption assumed to equal imports.

TABLE 2
U.S. ASBESTOS CONSUMPTION BY END USE, GRADE, AND TYPE^{1,2}

(Metric tons)

End use	Chrysotile					Total
	Grade 3	Grade 4	Grade 5	Grade 7	Unspecified grade	
2007	4	37	368	1,240	80	1,730
2008:						
Coatings and compounds ³	--	8	215	309	--	533
Roofing products	--	--	--	497	--	497
Other ⁴	4	44	11	126	248 ⁵	433
Total	4	52	226	932	248	1,460

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Estimated distribution based upon data provided by the Chrysotile Institute, Montreal, Quebec, Canada.

³Most of the asbestos reported under "Coating and compounds" probably was used in roofing products.

⁴Includes diaphragms used by the chlor-alkali industry, gaskets, and unknown applications.

⁵Most probably used by the chlor-alkali industry.

TABLE 3
VALUE OF U.S. EXPORTS AND REEXPORTS OF ASBESTOS FIBERS AND ASBESTOS-BASED PRODUCTS^{1,2,3}

(Thousand dollars)

Country	2007			2008		
	Unmanufactured fiber ⁴	Manufactured products	Total	Unmanufactured fiber ⁴	Manufactured products	Total
Australia	--	291	291	--	380	380
Brazil	--	413	413	--	837	837
Canada	3	7,340	7,340	--	6,630	6,630
China	62	2,340	2,400	52	3,570	3,620
France	--	233	233	--	53	53
Germany	--	237	237	--	334	334
Italy	--	165	165	--	170	170
Japan	--	380	380	--	529	529
Korea, Republic of	--	2,470	2,470	--	2,700	2,700
Mexico	88	6,880	6,960	51	7,290	7,340
Netherlands	--	196	196	--	34	34
United Kingdom	--	609	609	--	375	375
Venezuela	145	334	479	--	191	191
Other	123	7,300	7,430	242	10,100	10,300
Total	421	29,200	29,600	345	33,200	33,500

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Free alongside ship value.

³Data may include some nonasbestos products based on destination countries that have banned the use of asbestos.

⁴Includes exports of crudes, fibers, stucco, sand, and refuse. May also include nonasbestos materials.

Source: U.S. Census Bureau.

TABLE 4
U.S. EXPORTS AND REEXPORTS OF ASBESTOS AND ASBESTOS-BASED PRODUCTS¹

	2007		2008	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Unmanufactured, asbestos ³	815	\$421	368	\$345
Manufactured:				
Cement products ⁴	NA	282	NA	457
Friction products ⁵	NA	15,500	NA	16,000
Gaskets, packing and seals	NA	1,280	NA	1,730
Paper and millboard	NA	470	NA	1,560
Other articles ⁶	NA	11,700	NA	13,400
Total	NA	29,200	NA	33,200

NA Not available.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Free alongside ship value.

³Includes crudes, fibers, stucco, sand, and refuse. May also include nonasbestos materials.

⁴May include reexports and also cellulose fiber panel, sheet, tile, and tube cement products because asbestos-cement products are not manufactured in the United States.

⁵May include some nonasbestos brake and clutch shipments.

⁶May also include some nonasbestos materials.

Source: U.S. Census Bureau.

TABLE 5
U.S. IMPORTS FOR CONSUMPTION OF ASBESTOS FIBERS, BY TYPE AND ORIGIN¹

Type	Canada		South Africa		Zimbabwe		Total	
	Quantity (metric tons)	Value ² (thousands)						
2007:								
Chrysotile:								
Crude	80	\$14	--	--	--	--	80	\$14
Milled, grade 4	--	--	--	--	66	\$143	66	143
All other	1,110	279	--	--	14	33	1,120	312
Other, unspecified asbestos type	466	350	--	--	--	--	466	350
Total	1,650	643	--	--	80	176	1,730	819
2008:								
Chrysotile:								
Crude	30	21	--	--	--	--	30	21
Milled, grade 4	40	43	15	\$36	205	456	260	536
All other	821	252	14	33	14	36	849	321
Other, unspecified asbestos type	324	213	--	--	--	--	324	213
Total	1,220	529	29	70	219	492	1,460	1,090

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²U.S. customs declared value.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS OF PRODUCTS WITH BASIS OF ASBESTOS IN 2008

HTS ¹ code	Category	Quantity (metric tons)	Value ²	Major sources ³	Percentage of category total ⁴
2524.00.00.00	Asbestos	1,460	\$1,090,000	Canada	83% of weight.
6811.40.00.00	Asbestos-cement products	1,480	344,000	Canada, Mexico	98% of weight.
6812.80.90.00	Other, fabricated crocidolite fibers; clothing ⁵	(6)	5,080	Germany ⁷	100% of weight.
6812.91.10.00	Footwear, fabricated asbestos fibers; clothing ⁸	(6)	11,800	Pakistan	Do.
6812.91.90.00	Other, fabricated asbestos fibers; clothing ⁸	1	7,090	Austria, ⁷ China	Do.
6812.92.00.00	Felt, millboard, and paper ⁸	NA	53,200	China, Japan, Republic of Korea	100% of value.
6812.93.00.00	Compressed asbestos fiber jointing ⁸	NA	859,000	Mexico, Canada	99% of value.
6812.99.00.01	Other, miscellaneous ⁸	160	994,000	Mexico	100% of weight.
6812.99.00.02	Yarn and thread ⁸	11	76,800	do.	99% of weight.
6812.99.00.03	Cord and string ⁸	1	23,700	China, Japan	100% of weight.
6812.99.00.04	Woven or knitted fabric ⁸	--	3,630	China	Do.
6812.99.00.20	Gaskets, packing, and seals ⁸	123	703,000	China, India	94% of weight.
6812.99.00.25	Building materials	NA	48,000	Italy, ⁷ Australia ⁷	94% of value.
6812.99.00.55	Other, fabricated asbestos fiber ⁸	NA	627,000	South Africa	93% of value.
6813.20.00.10	Brake lining and pads, civil aircraft ⁸	NA	2,850,000	France, ⁷ United Kingdom ⁷	98% of value.
6813.20.00.15	Brake lining and pads, other	NA	5,880,000	China, Japan	76% of value.
6813.20.00.20	Articles for use in civil aircraft	NA	95,300	United Kingdom, ⁷ China	100% of value.
6813.20.00.25	Other, friction materials	NA	5,850,000	do.	79% of value.

Do., do. Ditto. NA Not available. -- Zero.

¹Harmonized Tariff Schedule of the United States.

²U.S. Customs declared value.

³Countries are listed in decreasing order.

⁴Percentage contribution of total imports by major import sources, by weight or value.

⁵Products likely to have been inaccurately classified and products probably do not contain crocidolite.

⁶Less than ½ unit.

⁷Source likely a supplier of nonasbestos products only.

⁸Mixtures with basis of asbestos or with a basis of asbestos and magnesium carbonate.

Source: U.S. Census Bureau.

TABLE 7
ASBESTOS: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2004	2005	2006	2007	2008
Argentina	267	260	299	282 ^r	280 ^e
Brazil, fiber	252,067	236,047	227,304	254,204	255,000 ^p
Bulgaria ^e	300	300	300	300	--
Canada	220,000	200,000 ^{r,e}	200,000 ^{r,e}	180,000 ^r	180,000 ^e
China ^e	400,000	400,000	360,000	390,000 ^r	280,000
Colombia, crude ore ^e	60,000	60,000	60,000	60,000	60,000
India ^e	18,000	19,000	20,000	21,000	20,000
Iran ^e	6,000 ⁴	1,300	1,300 ^r	1,400	1,400
Kazakhstan	346,500	305,500 ^r	314,700 ^r	292,600 ^r	230,100
Russia ^e	923,000 ⁴	925,000	925,000	1,025,000 ^{r,4}	1,017,000 ⁴
Serbia	7,300 ^{r,5}	4,080 ^{r,5}	4,500 ^r	-- ^r	--
Zimbabwe	104,000	122,041	100,000 ^e	80,000 ^{r,e}	50,000 ^e
Total	2,340,000 ^r	2,270,000 ^r	2,210,000 ^r	2,300,000 ^r	2,090,000

^eEstimated. ^pPreliminary. ^rRevised. --Zero.

¹World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Marketable fiber production. Table includes data available through April 23, 2009.

³In addition to the countries listed, Afghanistan, North Korea, Romania, and Slovakia also produce asbestos, but output is not officially reported, and available general information is inadequate for the formulation of reliable estimates of output levels.

⁴Reported figure.

⁵Montenegro and Serbia formally declared independence in June 2006 from each other and dissolved their union.