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# 2008 Minerals Yearbook

## ASBESTOS

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# 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



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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 STATISTICS[1]

| | | 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.

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

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

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

[4]U.S. customs declared value.

[5]Consumption assumed to equal imports.

TABLE 2

U.S. ASBESTOS CONSUMPTION BY END USE, GRADE, AND TYPE[1, 2]

(Metric tons)

| | Chrysotile | | | | | |
|---|---|---|---|---|---|---|
| End use | Grade 3 | Grade 4 | Grade 5 | Grade 7 | Unspecified grade | Total |
| 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.

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

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

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

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

[5]Most probably used by the chlor-alkali industry.


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TABLE 3

VALUE OF U.S. EXPORTS AND REEXPORTS OF ASBESTOS FIBERS AND ASBESTOS–BASED PRODUCTS[1, 2, 3]

(Thousand dollars)

| | 2007 | | | 2008 | | |
|---|---|---|---|---|---|---|
| Country | 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.

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

[2]Free alongside ship value.

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

[4]Includes 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 PRODUCTS[1]

| | 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.

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

[2]Free alongside ship value.

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

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

[5]May include some nonasbestos brake and clutch shipments.

[6]May also include some nonasbestos materials.

Source: U.S. Census Bureau.



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TABLE 5

U.S. IMPORTS FOR CONSUMPTION OF ASBESTOS FIBERS, BY TYPE AND ORIGIN[1]

| Type | Canada | | South Africa | | Zimbabwe | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Quantity (metric tons) | Value[2] (thousands) | Quantity (metric tons) | Value[2] (thousands) | Quantity (metric tons) | Value[2] (thousands) | 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.

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

[2]U.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.

[1]Harmonized Tariff Schedule of the United States.

[2]U.S. Customs declared value.

[3]Countries are listed in decreasing order.

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

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

[6]Less than ½ unit.

[7]Source likely a supplier of nonasbestos products only.

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

Source: U.S. Census Bureau.


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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 |

[e]Estimated. [p]Preliminary. [r]Revised. --Zero.

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

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

[3]In 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.

[4]Reported figure.

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



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