



2005 Minerals Yearbook

TALC AND PYROPHYLLITE

TALC AND PYROPHYLLITE

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In 2005, production of talc increased to 856,000 metric tons (t) valued at \$24.4 million from 833,000 t valued at \$23.2 million in 2004 (table 1). Domestic sales decreased to 826,000 t valued at \$71.3 million from 854,000 t valued at \$74.8 million in 2004. Exports decreased slightly to 198,000 t in 2005 from 202,000 t in 2004. Imports increased to 237,000 t in 2005 from an estimated 226,000 t in 2004. U.S. apparent consumption increased to 895,000 t in 2005 compared with 857,000 t in 2004. World production of talc and pyrophyllite was 8.25 million metric tons (Mt) in 2005 compared with 8.23 Mt in 2004. U.S. production and sales of pyrophyllite decreased in 2005 compared with 2004; data are withheld to avoid disclosing company proprietary data.

The mineral talc is a hydrous magnesium silicate. A massive talcose rock is called steatite, and an impure massive variety is known as soapstone. Talc is used commercially because of its fragrance retention, luster, purity, softness, and whiteness. Other commercially important properties of talc are its chemical inertness, high-dielectric strength, high-thermal conductivity, low electrical conductivity, and oil and grease adsorption. The major markets for talc are ceramics, paint, paper, and plastics.

Pyrophyllite is a hydrous aluminum silicate with a structure similar to talc. Such properties as chemical inertness, high dielectric strength, high melting point, and low electrical conductivity make it useful for ceramic and refractory applications.

Legislation and Government Programs

In 2005, the U.S. Department of Defense authorized the disposal of 867 t of block and lump talc and 1,050 t of ground talc, which was the entire uncommitted inventory, from the National Defense Stockpile.

Production

Talc.—Domestic production data were obtained through a voluntary survey of U.S. mining companies conducted by the U. S. Geological Survey (USGS). Survey forms were sent to 10 companies that mined talc. Responses were received from four companies, and two other companies did not mine talc in 2005. Data for nonrespondents were estimated from preliminary reported data based on 9 months of production in 2005, reported prior-year data adjusted according to employment and consuming industry trends, and data obtained from associated milling operations. Responses accounted for about 76% of the production data presented in table 1.

In 2005, 8 companies operating 10 mines in 6 States mined soapstone, steatite, and talc. All were open pit mining operations. The producers, in decreasing order of production, were Luzenac America Inc.; Wold Talc Co.; Barrett's Minerals Inc. (a subsidiary

of Minerals Technologies Inc.); Gouverneur Talc Co.; Milwhite Inc.; Suzorite Mineral Products Inc. (a subsidiary of Zemex Corp); New World Stone Co., and Steatite of Southern Oregon. CalTalc Co. did not mine in 2005 but worked from stockpiles. The four leading domestic producers collectively accounted for more than 75% of the U.S. tonnage mined.

In 2005, U.S. mine production increased to 856,000 t valued at \$24.4 million compared with 833,000 t valued at \$23.2 million in 2004 (table 1). Production increased slightly in Montana, Vermont, and Virginia and decreased slightly in California, New York, and Texas. Production in Oregon was almost unchanged from 2004. Montana led all States in the tonnage of talc produced, followed by Texas, Vermont, New York, Virginia, and Oregon. Mines operating in Montana, New York, Texas, and Vermont accounted for nearly all domestic talc production.

Pyrophyllite.—Domestic production data were acquired through a voluntary USGS survey of the three U.S. companies that mined pyrophyllite. Two companies responded to the survey; the remaining data were estimated from reported prior-year data adjusted according to employment data and consuming industry trends. Data are withheld to avoid disclosing company proprietary data.

Piedmont Minerals Co. Inc. and Standard Mineral Co. Inc. operated three mines in North Carolina. Production of pyrophyllite decreased slightly from that of 2004.

Consumption

Domestic consumption data for talc and pyrophyllite were developed by the USGS from a voluntary survey of U.S. mills. Survey forms were sent to 11 companies operating 13 mills in 7 States for talc and 2 companies operating 2 mills in 1 State for pyrophyllite. Responses accounted for 78% of the talc data presented in table 2. The remaining data were estimated from preliminary reported data based on 9 months of production in 2005 and reported prior-year data adjusted according to employment and consuming industry trends. Both pyrophyllite producers responded.

Talc.—Sales and use were 826,000 t of talc valued at \$71.3 million in 2005, a decrease from 854,000 t valued at \$74.8 million in 2004 (table 1). Domestic sales by U.S. producers decreased to 693,000 t in 2005 from 712,000 t in 2004. Talc was sold domestically for ceramics (sanitaryware and tiles), paint, paper, other (unspecified) applications, roofing, plastics, rubber, cosmetics, and refractory products, in decreasing order of consumption (table 2).

Sales of talc to manufacturers of paint, roofing, and tile generally are tied to the housing industry. Construction starts for new privately owned housing increased to 2.06 million units in 2005 from 1.96 million units in 2004 (U.S. Census

Bureau, 2006b§¹). The value of all construction (residential and commercial) increased to \$1.12 trillion in 2005 from \$1.03 trillion in 2004 (U.S. Census Bureau, 2006a§).

Shipments of architectural paint (the major paint market for talc) increased to 3.25 billion liters (858 million gallons) in 2005 from 3.06 billion liters (809 million gallons) in 2004 (U.S. Census Bureau, 2006). Ceramic tile is a major market for talc, and U.S. producers must sell their talc to tile producers that compete with imported ceramic tile. The U.S. International Trade Commission reported that imports of ceramic tile under Harmonized Tariff Schedule of the United States codes 6907.10.00, 6908.10.10, 6908.10.20, and 6908.10.50 increased to 31.5 million square meters valued at \$218 million in 2005 from 29.2 million square meters valued at \$198 million in 2004 (U.S. International Trade Commission, 2006§).

Most of the 237,000 t of imported talc listed in table 5 was not included in the domestic end-use data listed in table 2. An estimated end-use breakdown of sales of imports in 2005 is plastics, 98,000 t; cosmetics, 40,000 t; paint, 39,000 t; unknown, 25,000 t; ceramics and refractory products, 17,000 t; paper, 12,000 t; and rubber, 6,000 t.

Pyrophyllite.—In 2005, domestic consumption of pyrophyllite decreased from that of 2004; data are withheld to avoid disclosing company proprietary data. Pyrophyllite was used in ceramics, refractory products, paint, and unspecified applications, in decreasing order of consumption. Ceramic and refractory uses accounted for more than 50% of domestic pyrophyllite sales. The largest decline was in sales for refractory products.

Prices

The unit value of crude talc was estimated to be \$29 per metric ton. Most of the talc sold in the United States was sold only after crushing and grinding. Following sorting to remove waste, primary crushing, and screening, the unit value of the unmilled talc probably would be in the range of \$50 to \$60 per ton at the mill. The average reported unit value of processed talc was \$86 per ton in 2005, a slight decrease from \$88 per ton in 2004. The decline in unit value probably does not include energy surcharges that have become customary in the past couple of years. The average unit value of crude pyrophyllite was essentially unchanged from that of 2004 while that of processed pyrophyllite increased slightly.

The average free alongside ship unit value for exports of unmilled talc increased to \$251 per ton in 2005 from \$207 per ton in 2004. The large unit values in 2004 and 2005 probably reflect the inclusion of shipments of milled talc products, surface-treated talc, sculpting-grade talc, and possibly finished products, such as body powders under this U.S. Census Bureau Schedule B export code. The unit value for milled talc exports increased to \$208 per ton in 2005 from \$196 per ton in 2004. The unit value of all exports increased to \$211 per ton in 2005 from \$196 per ton in 2004.

The average customs unit value for imports of unground talc was \$148 per ton in 2005, an increase from \$127 per ton in 2004. The

average customs value for ground talc was \$175 per ton in 2005, a decline from \$293 per ton in 2004. The difference in unit values between 2004 and 2005 for this import code reflects the inclusion of several low-tonnage, high-value shipments that exceeded \$2,000 per ton (probably representing packaged talc products) in 2004. The average customs value for cut or sawed talc was \$874 per ton, essentially unchanged from 2004. The unit value for all talc imports was \$235 per ton in 2005 compared with \$258 per ton in 2004.

Prices for talc ranged from \$101 to \$403 per ton (table 3). Prices for pyrophyllite from the Republic of Korea, free on board port, were \$59 to \$65 per ton for fiber glass and refractory manufacturing, \$27 to \$44 per ton for ceramic grade, and \$110 to \$115 per ton for filler grade. The price for filler grades from Australia was \$342 per ton (Industrial Minerals, 2005). Quoted prices should be used only as a guideline because actual prices depend on the terms of the contract between seller and buyer.

Foreign Trade

Talc exports decreased in tonnage to 198,000 t valued at \$41.8 million in 2005 from 202,000 t valued at \$39.6 million in 2004. Canada was the leading importer of talc from the United States, followed by Mexico and Belgium (table 4). Much of the talc exported to Mexico was shipped to U.S. affiliates operating across the Mexican border and was not reported by the U.S. Census Bureau. Total talc exported to Mexico in 2005, including shipments to U.S. affiliates, exceeded 50,000 t.

Talc imports reported by the U.S. Census Bureau increased in tonnage to 237,000 t valued at \$55.6 million in 2005 from 226,000 t valued at \$58.4 million in 2004. China was the leading source for imported talc, followed by Canada (table 5).

World Industry Structure

World production of talc and pyrophyllite was estimated to be 8.25 Mt in 2005, almost unchanged from 8.23 Mt in 2004. China was the world's leading producer of talc, followed by the United States, India, Brazil (crude), and France (crude). The Republic of Korea was the leading producer of pyrophyllite, followed by Japan and Brazil. Brazil, China, France, India, Japan, the Republic of Korea, and the United States produced 85% of the world's talc and pyrophyllite (table 6).

World Review

France.—Rio Tinto plc announced a reorganization of its industrial minerals businesses. Luzenac Group, which has talc mines and mills on four continents, Rio Tinto Borax, and Dampier Salt Ltd., were placed under a common management and will operate as Rio Tinto Minerals. The action was taken to improve efficiencies of operation (Rio Tinto plc, 2005).

Outlook

Based on current trends, U.S. mining and sales of talc probably will remain relatively steady for the next few years. Talc imports increased dramatically between 1985 and 2000 but have leveled off in the past few years. China was the major source of the

¹References that include a section mark (§) are found in the Internet References Cited section.

increasing talc imports in the 1990s and is still the leading source of talc imports in 2005. With the continuing construction boom for residential and commercial buildings, sales of talc for such construction-related applications as adhesives, ceramics, joint compounds, paint, and roofing applications are expected to remain strong. The quantity of talc used in plastics is expected to increase as the volume of plastics used in consumer products increases and as manufacturers attempt to reduce costs associated with rising energy and resin prices. No major changes are expected in the pyrophyllite markets in the near future.

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TABLE 1
 SALIENT TALC AND PYROPHYLLITE STATISTICS¹

(Thousand metric tons and thousand dollars)

	2001	2002	2003	2004	2005
United States:					
Mine production, crude:					
Quantity:					
Talc	863	828	840	833 ^r	856
Pyrophyllite	W	W	W	W	W
Value:					
Talc	19,500	22,200	22,700	23,200 ^r	24,400
Pyrophyllite	W	W	W	W	W
Sold by producers, crude and processed:					
Quantity:					
Talc	784	764	845	854 ^r	826
Pyrophyllite	W	W	W	W	W
Value:					
Talc	84,800	75,000	75,200	74,800 ^r	71,300
Pyrophyllite	W	W	W	W	W
Exports, talc²					
Quantity:					
	137	166	192	202	198
Value:					
	28,800	35,700	39,100	39,600	41,800
Imports for consumption					
Quantity:					
	180	232	237	226	237
Value:					
	35,800	52,700	53,500	58,400	55,600
Apparent consumption³					
	906	894	885	857 ^r	895
World, production					
	8,780 ^r	7,590 ^r	8,100 ^r	8,230 ^r	8,250 ^e

^eEstimated. ^rRevised. W Withheld to avoid disclosing company proprietary data.

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

²Excludes powders-talcum (in package), face, and compact.

³Production plus imports minus exports plus adjustments in Government and industry stock. Does not include pyrophyllite.

TABLE 2
END USES FOR GROUND TALC¹

(Thousand metric tons)

	2004	2005
Ceramics ²	227 ^r	220
Cosmetics	8 ^r	8
Insecticides	--	--
Paint	147 ^r	139
Paper	114 ^r	114
Plastics	34 ^r	36
Refractories	--	1
Roofing	63 ^r	58
Rubber	24 ^r	21
Other ³	95 ^r	95
Total	712 ^r	693

^rRevised. -- Zero.

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

²Includes tile.

³Includes art sculpture, asphalt filler, auto body filler, construction caulks, flooring, joint compounds, and other uses not specified.

TABLE 3
PRICES OF TALC

(Dollars per metric ton)

	Price
New York:	
Paint:	
200 mesh	139
400 mesh	231
Ceramic:	
200 mesh	101
325 mesh	127
Indian, cosmetic-grade	190-195
Chinese, normal (ex-store UK):	
200 mesh	358-401
350 mesh	368-403

Source: Industrial Minerals, December 2005.

TABLE 4
U.S. EXPORTS OF TALC^{1,2}

(Thousand metric tons and thousand dollars)

Country	2004		2005	
	Quantity	Value ³	Quantity	Value ³
Belgium	9	1,930	10	2,250
Canada ⁴	102	14,000	94	14,200
Germany	4	1,120	3	889
Japan	7	1,510	6	1,390
Mexico	17	2,750	21	5,090
Singapore	5	1,460	2	750
Other ⁵	58	16,800	62	17,300
Total	202	39,600	198	41,800

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

²Excludes powders-talcum (in package), face, and compact.

³Free alongside ship.

⁴Probably includes shipments in transit through Canadian ports.

⁵Includes 66 countries in 2004 and 65 countries in 2005.

Source: U.S. Census Bureau.

TABLE 5
U.S. IMPORTS FOR CONSUMPTION OF TALC, BY COUNTRY¹

Country	Not crushed or powdered		Crushed or powdered		Cut and sawed		Total unmanufactured	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2004:								
Brazil	28	\$11	68	\$14	755	\$764	847	\$789
Canada	8	7	66,700	18,400	17,500	13,600	84,200	32,000
China	119,000	15,500	1,440	447	2,030	1,900	123,000	17,900
France	--	--	1,120	1,100	1,460	1,650	2,580	2,750
Japan	--	--	5,670	830	55	89	5,730	919
Other ²	6,070	528	2,400	1,990	687	1,610	9,160	4,130
Total	126,000	16,000	77,400	22,700	22,500	19,700	226,000	58,400
2005:								
Brazil	91	45	67	17	931	939	1,090	1,000
Canada	27	31	55,800	17,200	20,300	16,200	76,200	33,400
China	95,200	13,900	1,150	374	1,160	1,190	97,500	15,500
France	19	10	17,400	1,340	536	699	17,900	2,050
Japan	--	--	15,100	809	32	70	15,200	879
Other ²	127	84	28,000	885	807	1,750	28,900	2,720
Total	95,500	14,100	118,000	20,700	23,800	20,800	237,000	55,600

-- Zero.

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

²Includes 27 countries in 2004 and 26 countries in 2005.

Source: U.S. Census Bureau.

TABLE 6
TALC AND PYROPHYLLITE: WORLD PRODUCTION, BY COUNTRY AND PRODUCT^{1, 2}

(Metric tons)

Country ³	2001	2002	2003	2004	2005 ^c
Argentina:					
Pyrophyllite	2,155	1,770	1,894	2,178 ^r	2,200
Steatite ^c	300	300	300	300	300
Talc	1,665	1,643	1,700 ^r	7,620 ^r	7,600
Australia: ⁴					
Pyrophyllite ^c	1,500	868 ⁵	1,000	1,000	1,200
Talc	173,446	173,741	174,000 ^c	173,000 ^c	170,000
Austria, soapstone and talc, crude	137,776 ^r	138,195 ^r	137,596 ^r	138,000 ^{r, c}	138,000
Bhutan, talc ^c	3,800	3,900	3,900	3,900	4,000
Brazil:					
Pyrophyllite, crude	189,500	200,000	200,000 ^c	200,000 ^c	200,000
Talc:					
Crude	397,000	348,000	369,000 ^r	400,975 ^r	401,000
Marketable product ⁶	6,300	5,617	5,593	5,600 ^c	6,000
Canada, pyrophyllite, soapstone, talc ^c	90,000 ⁵	90,000	90,000	90,000	90,000
Chile, talc	4,177	3,537	4,374	2,993 ^r	3,000
China, unspecified ^c	3,500,000	2,500,000	3,000,000	3,000,000	3,000,000
Colombia, pyrophyllite, soapstone, talc ^c	15,000	15,000	15,000	15,000	15,000
Egypt, pyrophyllite, soapstone, steatite, talc ^c	40,000	40,000	40,000	40,000	40,000
France, talc, crude ^c	350,000	350,000	350,000	350,000	350,000
Germany, steatite and talc, marketable ^c	7,000 ^r	7,000 ^r	7,000 ^r	7,000 ^r	6,000
Guatemala, talc	--	568	1,585	2,863	2,900
Hungary, talc ^c	500	500	500	500	500
India: ^c					
Pyrophyllite	86,000	85,000	86,000	86,000	85,000
Steatite	546,000	550,000	552,000	550,000	545,000
Iran, talc ⁷	60,282 ^r	68,007 ^r	65,833 ^r	187,465 ^r	190,000
Italy, steatite and talc ^c	140,000	140,000	140,000	140,000	140,000
Japan:					
Pyrophyllite	403,137 ^r	416,188 ^r	408,435 ^r	401,688 ^r	410,000
Talc	18,478 ^r	22,142 ^r	24,328 ^r	18,253 ^r	21,000
Korea, North, unspecified ^c	60,000 ^r	50,000 ^r	50,000 ^r	50,000 ^r	50,000
Korea, Republic of:					
Pyrophyllite	1,101,825	889,961	912,285	827,895 ^r	820,000
Talc	47,712	37,863	47,911	79,313 ^r	79,500
Macedonia, talc	557	550	550	600 ^c	600
Mexico, talc	77,650	111,621	114,870	101,896 ^r	100,000
Morocco	27,246	39,612	1,959	2,000 ^c	2,000
Nepal, talc ⁸	3,923	2,621	6,905 ^r	3,435 ^r	3,600
Norway, soapstone, steatite, talc ^c	27,000	28,000	28,000	28,000	29,000
Pakistan, pyrophyllite ^c	55,000	57,500 ⁵	55,000	55,000	57,500
Paraguay, pyrophyllite, soapstone, talc ^c	200	200	200	200	200
Peru:					
Pyrophyllite ^c	8,000	8,000	12,296 ⁵	14,282 ^{r, 5}	14,500
Talc	11,165	10,685	10,791	9,548 ^r	10,000
Portugal, talc ^c	8,200	8,200	8,200	8,000	8,000
Romania, talc	7,270	7,292	10,082	10,000 ^c	10,000
Russia, talc ^c	100,000	100,000	100,000	100,000	100,000
Slovakia, talc	2,600	2,290	1,000	1,500 ^c	1,500
South Africa:					
Pyrophyllite	14,047 ^r	15,587	14,350 ^r	35,152 ^r	55,278 ⁵
Talc	3,030 ^r	2,511	6,719 ^r	8,115 ^r	8,469 ⁵
Spain, steatite and talc ^c	100,000	100,000	100,000	100,000	100,000
Sweden, soapstone and talc	15,000	15,000	15,000	14,000 ^c	14,000

See footnotes at end of table.

TABLE 6—Continued
TALC AND PYROPHYLLITE: WORLD PRODUCTION, BY COUNTRY AND PRODUCT^{1,2}

(Metric tons)

Country ³	2001	2002	2003	2004	2005 ^c
Taiwan, talc	130	27	466	411	-- ⁵
Thailand:					
Pyrophyllite	59,602	103,496	73,556	108,691 ^r	85,000
Talc	6,838	1,702	8,501	12,592 ^r	9,500
Turkey	883	98	60 ^r	60 ^{r,c}	100
Uganda, soapstone	--	-- ^r	-- ^r	-- ^r	--
United Kingdom, pyrophyllite, soapstone, talc ^c	5,000	5,000	5,000	5,000	5,000
United States:					
Pyrophyllite	W	W	W	W	W
Talc	863,000	828,000	840,000	833,000 ^r	856,000 ⁵
Uruguay, pyrophyllite, soapstone, talc	1,694	816 ^r	1,095 ^r	1,042 ^r	1,100
Zimbabwe, talc	1,273	911	196	--	--
Grand total	8,780,000 ^r	7,590,000 ^r	8,100,000 ^r	8,230,000 ^r	8,250,000
Of which:					
Pyrophyllite	1,920,000 ^r	1,780,000 ^r	1,760,000 ^r	1,730,000 ^r	1,730,000
Steatite	546,000	550,000	552,000	550,000	545,000
Talc	2,150,000 ^r	2,090,000 ^r	2,160,000 ^r	2,320,000 ^r	2,340,000
Unspecified	4,170,000 ^r	3,170,000 ^r	3,630,000 ^r	3,630,000 ^r	3,630,000

^cEstimated. ^rRevised. W Withheld to avoid disclosing company proprietary data; not included in "Total." -- Zero.

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

²Table includes data available through April 19, 2006.

³In addition to the countries listed, Nigeria may produce talc, but information is inadequate to estimate output.

⁴Data based on fiscal year ending June 30 of year stated.

⁵Reported figure.

⁶Direct sales and/or beneficiated (marketable product).

⁷Data based on fiscal year beginning March 21 of year stated.

⁸Data based on fiscal year beginning mid-July of year stated.