

2019 Minerals Yearbook

TALC AND PYROPHYLLITE [ADVANCE RELEASE]

TALC AND PYROPHYLLITE

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In 2019, mine production of crude talc in the United States decreased by 11% to 578,000 metric tons (t) valued at \$23 million compared with 648,000 t valued at \$23.8 million in 2018; the quantity of talc sold decreased by 4% to 515,000 t valued at \$124 million compared with the revised 537,000 t valued at \$121 million in 2018 (table 1). U.S. apparent consumption of talc decreased by 3% to 562,000 t from the revised 577,000 t in 2018. Exports of talc in 2019 decreased by 14% to 234,000 t valued at \$120 million from 273,000 t valued at \$132 million; imports in 2019 decreased by 10% to 281,000 t valued at \$109 million from 313,000 t valued at \$122 million in 2018. World production of talc, pyrophyllite, and related materials totaled 6.14 million metric tons (Mt) in 2019, slightly lower than the revised 6.25 Mt produced in 2018. Considering production of talc (including soapstone and steatite) only, the United States ranked third globally, following China and India.

Talc is a hydrous magnesium silicate composed of weakly bonded layers that can easily slide past one another, imparting a distinct slippery feel coupled with a low hardness (Mohs scale of 1). Properties that make talc useful for commercial applications include chemical inertness, high dielectric strength, high fusion point, high thermal conductivity, low electrical conductivity, and low oil and grease absorption. Talc typically forms through hydrothermal alteration of mafic to ultramafic rocks or by low-grade thermal metamorphism of siliceous dolomites. Within the United States, talc has been mined primarily in Montana, New York, Texas, and Vermont (Deer and others, 1966, p. 227–230; McCarthy and others, 2006, p. 972–974; Tomaino, 2016). Pyrophyllite, a hydrous aluminum silicate, exhibits physical and chemical properties similar to those of talc and, within the United States, traditionally has been mined in North Carolina.

Talc production in the United States remained near or greater than 1 million metric tons per year (Mt/yr) from the early 1970s through the late 1990s, peaking in 1979 at greater than 1.3 Mt. U.S. apparent consumption of talc was near the 1 Mt/yr level from the mid-1980s until the end of the 20th century. Decreased demand for talc since 1995 resulted in decreased production in the United States. During the past decade, production stabilized at an average of 600,000 metric tons per year (t/yr). Factors contributing to the decline included technological developments that reduced the amount of talc incorporated into ceramic tile; the move of portions of the domestic ceramics manufacturing industry to countries with lower labor costs; decreased use of oil-based paints, for which talc is ideally suited; decreased paper manufacturing; replacement by chemical agents of some talc used for pitch control; a shift from talc-based to corn-starch-based cosmetic products; and increased use of imported talc (McCarthy and others, 2006, p. 981–983). In contrast, sales of talc for plastics increased by more than 66% from 1995 to 2019,

primarily a result of increased use in automobiles. A significant share of the consumption, however, was met by imported talc.

Pyrophyllite followed a similar trend to that of talc, with sales decreasing since 1979 as use in the manufacture of refractory products decreased owing to technological changes and reductions in domestic steelmaking capacity (Roskill Information Services Ltd., 1996, p. 192).

Production

Talc.—Domestic production data were obtained through a voluntary survey of U.S. talc producers conducted by the U.S. Geological Survey (USGS). Survey forms were sent to three companies, and responses were received from two. Production and value for the nonrespondent were estimated from previously reported data adjusted using data for other mining operations and mine employment hours reported by the Mine Safety and Health Administration (MSHA).

Three companies mined talc from open pit operations in the United States during 2019, operating five mines in three States: Montana, Texas, and Vermont. The producers were Barretts Minerals Inc. (a subsidiary of Minerals Technologies Inc.) in Montana, Dal-Tile Corp. in Texas, and Imerys S.A. in Montana and Vermont. U.S. mine production of crude talc in 2019 decreased by 11% to 578,000 t valued at \$23 million from 648,000 t valued at \$23.8 million in 2018 (table 1). Imerys' North American divisions Imerys Talc America, Imerys Talc Vermont, and Imerys Talc Canada filed for bankruptcy in February 2019 as the company considered liability issues related to talc use in baby powders (Bellon and Hals, 2019).

Pyrophyllite.—Domestic production data were obtained through a voluntary survey of U.S. pyrophyllite producers conducted by the USGS. The only producer, The Standard Mineral Division of R.T. Vanderbilt Holding Co., Inc., operated two pyrophyllite mines in North Carolina in 2019. Because of incomplete reporting, pyrophyllite output was estimated from previously reported data and adjusted according to MSHA mine employment hours, but production data were withheld to avoid disclosing company proprietary data. Production decreased slightly in 2019.

Consumption

Consumption data were derived by the USGS from voluntary surveys of three talc producers and one pyrophyllite producer. These four companies operated five talc mills in four States and a pyrophyllite mill in North Carolina. Two companies responded to the talc and pyrophyllite survey. Sales for the nonrespondents were estimated using previously reported data adjusted according to responses from other milling operations, trends in consuming industries, and MSHA mill employment hours.

Talc.—Total sales of talc (domestic and exports) by U.S. producers equaled 515,000 t valued at \$124 million in 2019, 4% less than the revised 537,000 t valued at \$121 million the prior year (table 1). Ceramics (mainly for catalytic converter bodies, ceramic tile, and sanitaryware) was the leading identified end use and accounted for 32% of sales, followed by paint (as a filler and extender), 19%; paper (mainly for pitch control), 17%; plastics (as a filler and extender), 11%; rubber (as a filler and dusting agent), 4%; roofing (as a bitumen filler and surface coating), 3%; and cosmetics, 2%. Unclassified end uses and exports accounted for the remaining 13% of U.S. talc sales and included animal feed, construction caulks, food, insecticides, joint compounds, pharmaceuticals, sculpture, and other miscellaneous applications (table 2).

Compared with those in 2018, U.S. talc sales during 2019 decreased by 26% for cosmetics, 23% for paint, and 11% for roofing (table 2). Sales of talc increased by 49% for ceramics, 19% for rubber, 8% for paper, and only slightly for plastics. Most of the 281,000 t of imported talc listed in table 4 was not included in the domestic end-use data in table 2. An estimated 50% of talc imports was used for manufacturing plastic components. Some talc, which was classified as “exports” (see footnote 3 in table 2) in previous years, was reported in more precise end-use categories for 2019. This talc was consumed primarily for ceramics, some of which was exported. The increase in the amount of talc for ceramics in 2019 in table 2, compared with that in 2018, reflects this change in reporting. Revisions for prior years were not available.

Borealis AG (Vienna, Austria), a producer of polyethylene and polypropylene, opened a compounding plant in Taylorsville, NC, in 2019 to produce polypropylene, thermoplastic polyolefin (TPO), and short fiber compounds. The plant was designed to produce a new low-density TPO which was 10% talc-filled and designed for automotive interiors (European Rubber Journal, 2019).

Pyrophyllite.—Domestic sales of pyrophyllite were estimated to have decreased slightly from that of in 2018. Pyrophyllite was used in refractory products, paint, and ceramics, in decreasing order of consumption. Refractory uses likely accounted for more than 50% of domestic sales.

Prices

In 2019, the average unit value of mine-run crude talc was estimated to be \$40 per metric ton, 8% higher than \$37 per metric ton in 2018. The unit value of processed talc was estimated to be \$240 per metric ton compared with \$226 per metric ton in 2018, a 6% increase (table 1). Sufficient information was not available to estimate the change in value of any type of pyrophyllite.

Trade data were obtained from the U.S. Census Bureau. The average free alongside ship unit value of all talc exports during 2018 increased by 6% to \$512 per metric ton from \$483 per metric ton in 2018 (table 3). Crushed or powdered (milled) talc, the vast majority of which was exported under Schedule B number 2526.20.0000, had an average unit value of \$511 per metric ton in 2019, a 6% increase from \$483 per metric ton in 2018. The average unit value of exports that were not crushed or powdered (unmilled talc), which are a relatively small portion

of total talc exports and exported under Schedule B number 2526.10.0000, increased by 44% to \$696 per metric ton in 2019 from \$482 per metric ton in 2018. High unit values for some unmilled talc shipments during recent years indicate that sawed or cut dimension talc or soapstone, specialty products (such as surface-treated milled talc), and (or) consumer talc products (such as talcum powder) may have been classified using the same Schedule B code.

The average customs unit value for total talc imports was \$389 per metric ton in 2019, unchanged from that in 2018 (table 4). The average unit value for imports of unmilled (not crushed or powdered) talc in 2019 increased by 19% to \$296 per metric ton from \$248 per metric ton in 2018. Milled (crushed or powdered) talc had an average customs unit value of \$359 per metric ton in 2019, a slight increase compared with \$351 per metric ton in 2018. The average unit value of cut or sawed talc [Harmonized Tariff Schedule of the United States (HTS) code 6815.99.2000] was \$1,170 per metric ton in 2019, a 10% decrease compared with \$1,300 per metric ton in 2018.

Foreign Trade

The tonnage of United States talc exports fell by 14% to 234,000 t valued at \$120 million in 2019 from 273,000 t valued at \$132 million in 2018, primarily owing to a 50% decrease of shipments to Poland in 2019 compared with those in 2018 (table 3). Four countries each received more than 8% of United States exports: Mexico (30%), Canada (20%), China (15%), and Poland (9%). The remainder was distributed among 56 additional countries.

U.S. talc imports during 2019 totaled 281,000 t valued at \$109 million, 10% less than imports of 313,000 t valued at \$122 million in 2018 (table 4). Decreased talc deliveries from Canada (23%) and Pakistan (13%) were partially offset by a 36% increase in imports from China. Pakistan was the leading source for imported talc by tonnage, representing 41% of the total, followed by Canada with 25%, China with 16%, and the remainder distributed among 29 other countries or localities. Shipments from Pakistan likely included large quantities of talc mined in Afghanistan. About 78% of talc imports was crushed or powdered, 17% was not crushed or powdered, and 5% was cut or sawed. China (82%) and France (21%) were the predominant sources of the uncrushed or powdered talc imports in 2019; Pakistan and Canada accounted for 52% and 29%, respectively, of crushed or powdered talc imports; and Canada supplied 55% of cut or sawed imports, followed by China (35%) and Brazil (5%).

World Review

World production of talc, pyrophyllite, and related materials was estimated to be 6.14 Mt in 2019, slightly less than the revised 6.25 Mt produced in 2018 (table 5). Brazil, China, Finland, France, India, the Republic of Korea, and the United States each produced at least 5% of the world total and collectively accounted for 76% of the global output. Because many countries reported combined production, it was unclear what percentage of production was pyrophyllite, talc, or another related material. Of the 6.14 Mt produced, 67% was reported as

combined production, 18% was talc, and 15% was pyrophyllite. In addition to the countries and (or) localities listed in table 5, Afghanistan likely produced a significant tonnage of talc that was exported via Pakistan, but available information was inadequate to make a reliable estimate of output. In Afghanistan, Amin Karimzai Ltd. reported a mine production capacity of 400,000 t/yr of talc; talc also was mined through artisanal and small- to medium-scale operations (Hughes, 2013; Renaud, 2016).

The Scotia talc mine in South Africa was abandoned in 2019 after 111 years of operation after a strike by members of the Association of Mineworkers and Construction Union. The mine, owned by Chamotte Holdings (Pty) Ltd. and near the town of Sheba Siding, produced about 3,500 t/yr (Mahlaka, 2019).

Outlook

Sales of talc for such items as adhesives, caulks, ceramics (mainly tile), joint compounds, paint, putties, and roofing materials are strongly tied to commercial and residential construction activity. Housing starts for new privately owned units have increased since 2009, and sales of talc for construction-related markets may help lower the overall decrease in talc sales (U.S. Census Bureau, 2021). Production and sales of pyrophyllite were expected to decrease in 2020.

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TABLE 1
SALIENT TALC AND PYROPHYLLITE STATISTICS¹

(Thousand metric tons and thousand dollars)

	2015	2016	2017	2018	2019
United States:					
Mine production, crude:					
Quantity:					
Talc	615	578	610	648	578
Pyrophyllite	W	W	W	W	W
Value:					
Talc	18,100	17,200	21,900	23,800	23,000
Pyrophyllite	W	W	W	W	W
Sold by producers, processed:					
Quantity:					
Talc	535	528	528	537 ^r	515
Pyrophyllite	W	W	W	W	W
Value:					
Talc	99,700	104,000	113,000	121,000 ^r	124,000
Pyrophyllite	W	W	W	W	W
Exports, talc: ²					
Quantity	206	239	220	273	234
Value	59,400	82,800	123,000	132,000	120,000
Imports for consumption, talc: ²					
Quantity	322	378	336	313	281
Value	109,000	130,000	122,000	122,000	109,000
Apparent consumption, talc ³	651	667	644	577 ^r	562
World, production	6,740 ^r	6,500 ^r	6,120 ^r	6,250 ^r	6,140 ^e

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

¹Table includes data available through December 1, 2020. Data are rounded to no more than three significant digits.

²Excludes powder—talcum (in packages), face, and compact.

³Sold by producers plus imports minus exports. Company stockpiles were not considered because data were unavailable.

TABLE 2
END USES FOR TALC PRODUCED IN THE UNITED STATES¹

(Metric tons)

End use	2018	2019
Ceramics ²	109,000	162,000
Cosmetics	10,900	8,080
Paint	128,000	98,400
Paper	80,400	87,000
Plastics	53,900 ^r	54,800
Roofing	16,300	14,500
Rubber	19,100	22,700
Other ³	120,000	67,100
Total	537,000 ^r	515,000

^rRevised.

¹Table includes data available through December 1, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes automotive catalytic converter bodies, ceramic tile, potteryware, sanitaryware, and technical ceramics.

³Includes animal feed, construction caulks, exports, food, insecticides, joint compounds, pharmaceuticals, sculpture, and other uses not specified. In 2019, some talc previously classified as “exports” was reported in more precise end-use categories.

TABLE 3
U.S. EXPORTS OF TALC, BY COUNTRY OR LOCALITY^{1,2}

Country or locality	2018		2019	
	Quantity (metric tons)	Value ³ (thousands)	Quantity (metric tons)	Value ³ (thousands)
Argentina	1,140	\$699	2,050	\$1,200
Australia	105	101	256	172
Belgium	9,230	4,110	1,490	783
Brazil	11,000	4,130	7,510	3,370
Canada ⁴	47,800	13,600	46,000	13,200
Chile	4,670	2,260	3,320	1,520
China	36,900	24,600	34,100	20,100
Colombia	2,010	1,340	1,520	938
Costa Rica	1,250	369	870	235
France	1,000	703	1,200	766
Indonesia	7,260	5,870	14,700	16,400
Italy	759	581	729	576
Japan	4,690	2,540	4,860	2,590
Korea, Republic of	2,660	948	3,930	1,350
Malaysia	1,240	642	1,120	575
Mexico	58,800 ^r	28,400 ^r	70,800	29,700
Philippines	1,750	648	1,440	595
Poland ⁵	47,800 ^r	18,600	21,900	17,300
Singapore	1,980	1,020	1,890	982
Taiwan	2,130	1,160	1,720	1,010
Thailand	4,270	2,890	2,620	1,910
United Kingdom	602 ^r	440	681	395
Uruguay	1,380	510	1,820	657
Other ⁶	22,900	15,800	7,060	3,570
Total	273,000	132,000	234,000	120,000

^rRevised.

¹Table includes data available through August 29, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Does not include powder—talcum (in packages), face, and compact—or cut and sawed talc.

³Free alongside ship.

⁴Thought to include shipments in transit through Canadian ports.

⁵Thought to include materials that are only partially composed of talc.

⁶Includes 37 countries and (or) localities in 2018 and 2019.

Source: U.S. Census Bureau.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF TALC, BY COUNTRY OR LOCALITY¹

Country or locality	Not crushed or powdered		Crushed or powdered		Cut and sawed		Total unmanufactured	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
2018:								
Australia	7,350	\$640	14,000	\$2,460	(3)	\$4	21,300	\$3,100
Austria	--	--	296	337	--	--	296	337
Brazil	17	45	146	79	1,210	1,590	1,370	1,710
Canada	186	423	79,200	41,400	12,000	14,100	91,400	55,900
China	21,800	6,420	8,820	2,820	2,420	3,380	33,000	12,600
France	5,410	959	2,320	2,420	(3)	8	7,720	3,390
Hong Kong	1	10	10,300	3,450	3	11	10,300	3,470
India	388	212	1,570	511	382	770	2,340	1,490
Italy	(3)	3	1,960	2,150	31	61	2,000	2,220
Japan	--	--	1,470	1,830	87	603	1,560	2,430
Netherlands	--	--	11,400	6,360	--	--	11,400	6,360
Pakistan	22	14	130,000	27,600	--	--	130,000	27,600
Other ⁴	--	--	549	559	171	669	720	1,230
Total	35,100	8,730	262,000	91,900	16,300	21,200	313,000	122,000
2019:								
Australia	--	--	19,700	2,280	--	--	19,700	2,280
Austria	--	--	259	257	22	142	259	399
Brazil	9	20	143	72	696	900	848	992
Canada	209	446	62,900	34,400	7,640	9,780	70,800	44,600
China	38,300	10,800	1,800	1,320	4,860	3,660	45,000	15,700
France	7,410	819	1,890	2,160	29	41	9,330	3,020
Hong Kong	3	7	19	8	22	6	44	21
India	603	1,740	548	198	369	760	1,520	2,700
Italy	--	--	1,740	1,870	2	20	1,740	1,890
Japan	--	--	1,570	2,350	41	307	1,610	2,660
Netherlands	--	--	14,900	7,960	(3)	5	14,900	7,960
Pakistan	--	--	114,000	25,500	(3)	5	114,000	25,500
Other ⁴	--	--	1,060	643	128	531	1,190	1,230
Total	46,600	13,800	220,000	79,000	13,800	16,200	281,000	109,000

-- Zero.

¹Table includes data available through August 29, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²U.S. customs declared value.

³Less than ½ unit.

⁴Includes 18 countries and (or) localities in 2018 and 20 countries and (or) localities in 2019.

Source: U.S. Census Bureau.

TABLE 5
TALC AND PYROPHYLLITE: WORLD PRODUCTION, BY COUNTRY OR LOCALITY AND PRODUCT¹

(Metric tons)

Country or locality and product	2015	2016	2017	2018	2019
Argentina	27,386	11,262	8,335	11,728 ^r	11,000 ^e
Australia, chlorite, pyrophyllite, steatite, talc ^e	80,000	111,000	110,000	100,000	100,000
Austria, talc, including leucophyllite	122,326	123,040	123,558	127,866 ^r	124,184
Bhutan, talc	5,807	2,261	1,293 ^r	2,042 ^r	1,375
Brazil, talc and pyrophyllite:					
Beneficiated	160,864 ^r	162,870 ^r	160,000 ^e	160,000 ^e	160,000 ^e
Crude	481,687 ^r	494,157 ^r	500,000 ^{r, e}	500,000 ^e	500,000 ^e
Total	642,551 ^r	657,027 ^r	660,000 ^{r, e}	660,000 ^e	660,000 ^e
Canada, pyrophyllite, soapstone, talc	175,000	199,000	215,000	246,000 ^r	240,000 ^e
China, talc and related materials	1,846,000	1,641,800 ^r	1,275,800 ^r	1,400,000 ^{r, e}	1,400,000 ^e
Egypt, pyrophyllite, soapstone, talc	24,360	21,672	15,000 ^e	15,000 ^e	15,000 ^e
Finland, talc	332,174 ^r	345,739	354,819	374,398	329,891
France, talc, crude ^e	450,000	450,000	450,000	450,000	450,000
Guatemala, talc	3,779	2,733	1,981	2,187 ^r	2,100 ^e
India:					
Pyrophyllite ^e	167,000	170,000	170,000	170,000	170,000
Soapstone and steatite	803,000 ^e	730,000	750,000 ^e	750,000 ^e	750,000 ^e
Total	970,000 ^e	900,000	920,000 ^e	920,000 ^e	920,000 ^e
Iran, talc	137,135	130,000	130,000 ^e	130,000 ^e	130,000 ^e
Italy, steatite and talc ^e	165,000	165,000	165,000	165,000	165,000
Japan, pyrophyllite ^e	160,000	160,000	160,000	160,000	160,000
Korea, Republic of:					
Pyrophyllite	596,860	590,000	431,458	346,761	327,624
Talc	6,371	2,247	2,834	1,887	2,626
Total	603,231	592,247	434,292	348,648	330,250
Macedonia, talc	598	715	878	900 ^e	NA
Mexico, talc	20,452	11,392	12,000 ^e	12,000 ^e	12,000 ^e
Nepal, talc ²	1,860	3,003	4,873	4,900 ^e	4,900 ^e
Nigeria, talc	NA	667	1,897	2,668 ^r	2,700 ^e
Pakistan, soapstone	113,509	116,678	177,345	132,272 ^r	183,000 ^e
Peru:					
Pyrophyllite	26,209	17,872	22,760	26,675	25,039
Talc	26,781 ^r	11,507	19,363	20,634	18,935
Total	52,990 ^r	29,379	42,123	47,309	43,974
Portugal, talc	11,204	11,699	13,600	10,144	12,901
Saudi Arabia, pyrophyllite	40,000	42,000	44,000	46,000	48,000
Slovakia, talc	1,000	700	13,988	14,000 ^e	14,000 ^e
South Africa:					
Pyrophyllite	17,352	19,114	55,048	98,245 ^r	134,451
Talc	4,497	4,462	3,728	3,897 ^r	979
Total	21,849	23,576	58,776	102,142 ^r	135,430
Sudan, talc	3,000	4,200	NA	NA	NA
Taiwan, talc	162	250	--	17	6
Thailand:					
Pyrophyllite	45,500	96,800	54,000	50,920	6,500
Talc	6,768	7,126	7,436	7,756	8,064
Total	52,268	103,926	61,436	58,676	14,564
Turkey:					
Pyrophyllite ^e	50,000	50,000	50,000	50,000	50,000
Talc	9,681	8,559	3,882	4,000	4,000 ^e
Total	59,681	58,559	53,882	54,000	54,000 ^e
United Kingdom, pyrophyllite, soapstone, talc	5,430	2,997	3,128 ^r	1,640 ^r	1,700 ^e

See footnotes at end of table.

TABLE 5—Continued
TALC AND PYROPHYLLITE: WORLD PRODUCTION, BY COUNTRY OR LOCALITY AND PRODUCT¹

(Metric tons)

Country or locality and product	2015	2016	2017	2018	2019
United States:					
Pyrophyllite	W	W	W	W	W
Talc	615,000	578,000	610,000	648,000	578,000
Total	615,000	578,000	610,000	648,000	578,000
Uruguay, pyrophyllite, soapstone, steatite, talc	590	290	100	420 ^r	400 ^e
Grand total	6,740,000 ^r	6,500,000 ^r	6,120,000 ^r	6,250,000 ^r	6,140,000 ^e
Of which:					
Pyrophyllite	1,100,000	1,150,000	987,000	949,000 ^r	922,000
Talc	1,190,000 ^r	1,130,000 ^r	1,180,000 ^r	1,240,000 ^r	1,120,000
Other and unspecified	4,460,000 ^r	4,230,000 ^r	3,950,000 ^r	4,060,000 ^r	4,100,000

^eEstimated. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; not included in grand totals. -- Zero.

¹Table includes data available through November 4, 2020. All data are reported unless otherwise noted. Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Production is based on fiscal year, which began on July 16 of the stated year and ended on July 15 of the following year.