

## CLAYS

(Data in thousand metric tons unless otherwise noted)

**Domestic Production and Use:** Production of clays (sold or used) in the United States was estimated to be 25 million tons valued at \$1.5 billion in 2021, with about 120 companies operating clay and shale mines in 38 States. The leading 20 companies produced approximately 65% of the U.S. tonnage and 84% of the value for all types of clay. Principal domestic uses for specific clays were estimated to be as follows: ball clay—50% floor and wall tile and 18% sanitaryware; bentonite—50% pet waste absorbents and 22% drilling mud; common clay—45% brick, 28% lightweight aggregate, and 22% cement; fire clay—82% heavy clay and lightweight aggregates products (for example, brick, cement, and concrete) and 14% refractory products and miscellaneous uses; fuller's earth—81% absorbents (includes oil and grease absorbents, pet waste absorbents, and miscellaneous absorbents); and kaolin—30% paper coating and filling, 15% miscellaneous ceramics, and 15% refractory products.

Exports of clay and shale were estimated have increased by 16% in 2021 after decreasing by 13% in 2020. In 2021, the United States exported an estimated 800,000 tons of bentonite with Canada, Japan, and China, in decreasing order, being the leading destinations. About 2.3 million tons of kaolin was exported mainly as a paper coating and filler; a component in ceramic bodies; and fillers and extenders in paint, plastic, and rubber products, with China, Mexico, and Japan, in decreasing order, being the leading destinations. Lesser quantities of ball clay, fire clay, and fuller's earth were exported for ceramic, refractory, and absorbent uses, respectively.

<b>Salient Statistics—United States:</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021<sup>e</sup></b>
Production (sold or used):					
Ball clay <sup>e</sup>	1,270	1,110	1,060	1,080	1,100
Bentonite	4,450	4,570	4,520	4,240	4,300
Common clay	13,600	12,900	12,800	12,600	13,000
Fire clay	575	567	603	635	650
Fuller's earth <sup>e, 1</sup>	1,840	1,880	1,990	1,980	2,000
Kaolin <sup>e</sup>	<u>5,450</u>	<u>5,350</u>	<u>5,060</u>	<u>4,570</u>	<u>4,100</u>
Total <sup>1, 2</sup>	27,200	26,400	26,100	25,100	25,000
Imports for consumption:					
Artificially activated clays and earths	28	23	31	31	40
Kaolin	316	330	293	224	190
Other	<u>86</u>	<u>68</u>	<u>66</u>	<u>28</u>	<u>40</u>
Total <sup>2</sup>	430	421	389	284	270
Exports:					
Artificially activated clays and earths	147	149	138	127	140
Ball clay	83	90	85	68	130
Bentonite	961	845	906	728	800
Clays, not elsewhere classified	244	244	204	185	170
Fire clay <sup>3</sup>	225	250	194	190	190
Fuller's earth	78	70	73	77	80
Kaolin	<u>2,310</u>	<u>2,390</u>	<u>2,280</u>	<u>1,980</u>	<u>2,300</u>
Total <sup>2</sup>	4,040	4,030	3,880	3,360	3,900
Consumption, apparent <sup>4</sup>	23,600	22,800	22,600	22,100	21,000
Price, ex-works, average unit value, dollars per ton:					
Ball clay	49	55	56	58	64
Bentonite	99	98	98	96	94
Common clay	15	16	17	16	16
Fire clay	13	12	14	13	13
Fuller's earth <sup>1</sup>	93	88	88	89	88
Kaolin	158	160	162	160	160
Employment (excludes office workers), number: <sup>e</sup>					
Mine (may not include contract workers)	1,220	1,110	1,110	1,060	1,060
Mill	4,370	4,310	4,310	4,260	4,240
Net import reliance <sup>5</sup> as a percentage of apparent consumption	E	E	E	E	E

**Recycling:** Insignificant.

**Import Sources (2017–20):** All clay types combined: Brazil, 70%; Mexico, 9%; China, 7%; and other, 14%.

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<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12-31-21</b>
	Kaolin and other kaolinic clays, whether or not calcined	2507.00.0000	Free.
	Bentonite	2508.10.0000	Free.
	Fire clay	2508.30.0000	Free.
	Common blue clay and other ball clays	2508.40.0110	Free.
	Decolorizing earths and fuller's earth	2508.40.0120	Free.
	Other clays	2508.40.0150	Free.
	Chamotte or dinas earth	2508.70.0000	Free.
	Activated clays and activated earths	3802.90.2000	2.5% ad valorem.
	Expanded clays and other mixtures	6806.20.0000	Free.

**Depletion Allowance:** Ball clay, bentonite, fire clay, fuller's earth, and kaolin, 14% (domestic and foreign); clay used in the manufacture of common brick, lightweight aggregate, and sewer pipe, 7.5% (domestic and foreign); clay used in the manufacture of drain and roofing tile, flowerpots, and kindred products, 5% (domestic and foreign); clay from which alumina and aluminum compounds are extracted, 22% (domestic).

**Government Stockpile:** None.

**Events, Trends, and Issues:** In October 2021, a common clay producer headquartered in Tennessee finalized the acquisition of another common clay company headquartered in Georgia, which operated 20 plants throughout North America. In July 2021, a Georgia kaolin producer announced an agreement to purchase central Georgia assets that support the paper and board industry from another kaolin producer with North American headquarters in Georgia.

**World Mine Production and Reserves:**<sup>6</sup> Global reserves are large, but country-specific data were not available.

	<b>Mine production</b>					
	<b>Bentonite</b>		<b>Fuller's earth</b>		<b>Kaolin</b>	
	<b>2020</b>	<b>2021<sup>e</sup></b>	<b>2020</b>	<b>2021<sup>e</sup></b>	<b>2020</b>	<b>2021<sup>e</sup></b>
United States	4,240	4,300	11,980	12,000	4,570	4,100
Brazil (beneficiated)	217	200	—	—	1,240	1,200
China	2,500	2,500	—	—	6,500	6,400
Czechia	226	230	—	—	73,070	73,100
Germany	360	350	—	—	870	800
Greece	71,300	71,300	34	30	—	—
India	3,500	3,500	730	730	77,600	77,600
Iran	425	420	—	—	1,800	1,800
Mexico	25	20	110	110	120	120
Senegal	—	—	117	120	—	—
Spain	221	220	590	590	7450	7450
Turkey	1,500	1,700	60	60	1,200	1,200
Ukraine	180	180	—	—	1,680	1,600
Uzbekistan	25	20	—	—	5,900	5,500
Other countries	3,480	3,500	313	310	11,400	11,000
World total (rounded)	18,200	18,000	13,930	14,000	46,400	45,000

**World Resources:**<sup>6</sup> Resources of all clays are extremely large.

**Substitutes:** Clays compete with calcium carbonate in filler and extender applications; diatomite, organic pet litters, polymers, silica gel, and zeolites as absorbents; and various siding and roofing types in building construction.

<sup>e</sup>Estimated. E Net exporter. — Zero.

<sup>1</sup>Does not include U.S. production of attapulgite.

<sup>2</sup>Data may not add to totals shown because of independent rounding.

<sup>3</sup>Includes refractory-grade kaolin.

<sup>4</sup>Defined as production (sold or used) + imports – exports.

<sup>5</sup>Defined as imports – exports.

<sup>6</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>7</sup>Includes production of crude ore.