

CLAYS

(Data in thousand metric tons unless otherwise specified)

Domestic Production and Use: Production of clays (sold or used) in the United States was estimated to be 26 million tons valued at \$1.7 billion in 2023, with about 120 companies operating clay and shale mines in 38 States. The leading 20 companies produced approximately 68% 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 (49% floor and wall tile), bentonite (48% pet waste absorbents and 23% drilling mud), common clay (48% brick, 26% lightweight aggregate, and 22% cement), fuller's earth (81% absorbents, including oil and grease absorbents, pet waste absorbents, and miscellaneous absorbents), and kaolin (52% fillers, extenders, and binders and 25% ceramics). Fire clay uses were withheld to avoid disclosing company proprietary data.

Exports of clay and shale were estimated to have decreased by 10% in 2023 from those in 2022. In 2023, the United States exported an estimated 800,000 tons of bentonite; Canada, Japan, and Mexico, in decreasing order, were the leading destinations. About 1.8 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; Mexico, China, and Japan, in decreasing order, were the leading destinations. Lesser quantities of ball clay, fire clay, and fuller's earth were exported.

Salient Statistics—United States:	2019	2020	2021	2022	2023^e
Production (sold or used):					
Ball clay	^e 967	985	^e 1,080	^e 1,030	1,000
Bentonite	4,520	4,250	4,580	4,580	4,700
Common clay	13,400	12,900	12,700	12,700	13,000
Fire clay	603	635	675	^e 622	660
Fuller's earth ^{e, 1}	1,990	1,980	2,130	2,160	2,300
Kaolin ^e	<u>5,120</u>	<u>4,640</u>	<u>4,360</u>	<u>4,340</u>	<u>4,400</u>
Total ^{1, 2}	26,500	25,400	25,600	25,500	26,000
Imports for consumption:					
Artificially activated clays and earths	31	31	41	58	94
Kaolin	293	224	149	200	150
Other	<u>66</u>	<u>28</u>	<u>47</u>	<u>49</u>	<u>38</u>
Total ²	389	284	237	306	280
Exports:					
Artificially activated clays and earths	138	127	139	135	110
Ball clay	85	68	139	165	130
Bentonite	906	728	861	830	800
Clays, not elsewhere classified	204	185	186	208	210
Fire clay ³	194	190	210	158	140
Fuller's earth	73	77	83	87	73
Kaolin	<u>2,280</u>	<u>1,990</u>	<u>2,330</u>	<u>2,030</u>	<u>1,800</u>
Total ²	3,880	3,360	3,950	3,620	3,300
Consumption, apparent ⁴	23,000	22,300	21,900	22,200	23,000
Price, average unit value, ex-works, dollars per metric ton:					
Ball clay	45	46	46	47	47
Bentonite	98	97	100	101	99
Common clay	18	17	17	18	17
Fire clay	14	12	12	12	12
Fuller's earth ¹	88	89	88	97	95
Kaolin	161	159	152	157	160
Employment (excludes office workers), number: ^e					
Mine (may not include contract workers)	1,110	1,060	1,060	1,060	1,100
Mill	4,310	4,260	4,240	4,240	4,300
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Recycling: Insignificant.

Import Sources (2019–22): All clay types combined: Brazil, 66%; Mexico, 16%; China, 4%; and other, 14%.

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Tariff:	Item	Number	Normal Trade Relations
			<u>12-31-23</u>
	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: The total tonnage of clays sold or used by domestic producers increased from that in 2022; bentonite, common clay, fire clay, fuller's earth, and kaolin increased whereas ball clay decreased in 2023. Imports for all types of clay decreased by 8% to 280,000 tons; Brazil, Mexico, and China were the major sources for imported clays. U.S. apparent consumption in 2023 was estimated to be 23 million tons, a 4% increase from that in 2022.

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

	Mine production					
	Bentonite		Fuller's earth		Kaolin	
	<u>2022</u>	<u>2023^e</u>	<u>2022</u>	<u>2023^e</u>	<u>2022</u>	<u>2023^e</u>
United States	4,580	4,700	¹ 2,160	¹ 2,300	4,340	4,400
Brazil (beneficiated)	220	220	—	—	1,200	1,200
China	2,100	2,100	—	—	8,400	8,400
Czechia	230	230	—	—	⁷ 3,100	⁷ 3,100
Denmark	908	900	—	—	—	—
Greece	⁷ 1,420	⁷ 1,400	33	30	—	—
India	3,700	3,700	730	730	⁷ 8,370	⁷ 8,400
Iran	850	850	—	—	2,100	2,100
Mexico	79	80	120	120	240	240
Russia	36	40	—	—	2,500	2,500
Senegal	—	—	117	120	—	—
Spain	170	170	570	570	⁷ 300	⁷ 300
Turkey	2,380	2,400	55	60	2,270	2,300
Uzbekistan	50	50	—	—	8,500	8,500
Other countries	<u>3,630</u>	<u>3,600</u>	<u>317</u>	<u>320</u>	<u>10,600</u>	<u>10,000</u>
World total (rounded) ²	20,400	20,000	¹⁴ 1,100	¹⁴ 1,300	51,900	51,000

World Resources:⁶ 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.

^eEstimated. E Net exporter. — Zero.

¹Does not include U.S. production of attapulgite.

²Data may not add to totals shown because of independent rounding.

³Includes refractory-grade kaolin.

⁴Defined as production (sold or used) + imports – exports.

⁵Defined as imports – exports.

⁶See Appendix C for resource and reserve definitions and information concerning data sources.

⁷Includes production of crude ore.