

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 27 million tons valued at \$1.6 billion in 2018, with about 145 companies operating clay and shale mines in 40 States. The leading 20 firms produced approximately 50% of the U.S. tonnage and 85% of the value for all types of clay. Principal uses for specific clays were estimated, in descending order, to be as follows: ball clay—50% floor and wall tile and 15% sanitaryware; bentonite—52% pet waste absorbents and 31% drilling mud; common clay—34% brick, 29% lightweight aggregate, and 24% cement; fire clay—70% heavy clay products (for example, brick and cement) and 30% refractory products and miscellaneous uses; fuller's earth—98% pet waste absorbents; and kaolin—60% paper coating and filling, 12% paint, and 9% catalysts. Lightweight ceramic proppants for use in hydraulic fracturing are also a significant market for kaolin, but available data were insufficient for a reliable estimate of the market size.

The United States accounted for 15% to 25% of the global production of refined clays, excluding common clay and shale. U.S. exports of bentonite decreased by an estimated 3% in 2018 relative to the prior year. Canada, Japan, and Mexico were, in decreasing order by tonnage, the leading destinations for United States bentonite and accounted for 67% of exports. Kaolin exports increased by an estimated 17% in 2018 relative to the prior year. Exports of kaolin went primarily to China, Mexico, Japan, Finland, and Canada, in decreasing order by tonnage.

Salient Statistics—United States:	2014	2015	2016	2017	2018^e
Production (sold or used):					
Ball clay	980	1,030	975	^e 900	1,000
Bentonite	4,580	4,050	3,600	^e 4,300	3,700
Common clay	10,900	11,300	11,700	^e 13,000	13,000
Fire clay	210	393	528	^e 440	460
Fuller's earth ¹	1,890	1,960	1,860	^e 1,700	1,600
Kaolin	<u>5,960</u>	<u>5,810</u>	<u>5,320</u>	<u>^e7,300</u>	<u>7,300</u>
Total ^{1, 2}	24,500	24,500	23,900	^e 28,000	27,000
Imports for consumption:					
Artificially activated clays and earths	26	24	26	28	21
Kaolin	518	426	389	480	326
Other	<u>47</u>	<u>70</u>	<u>58</u>	<u>86</u>	<u>63</u>
Total ²	591	520	473	594	410
Exports:					
Artificially activated clays and earths	175	173	143	147	170
Ball clay	33	48	41	83	100
Bentonite	901	938	801	961	930
Clays, not elsewhere classified	282	268	256	243	280
Fire clay ³	237	217	184	225	280
Fuller's earth	92	77	86	78	82
Kaolin	<u>2,640</u>	<u>2,420</u>	<u>2,290</u>	<u>2,310</u>	<u>2,700</u>
Total ²	4,360	4,140	3,800	4,050	4,500
Consumption, apparent ⁴	21,900	21,000	20,700	^e 25,000	23,000
Price, ex-works, average, dollars per ton:					
Ball clay	44	46	45	46	46
Bentonite	67	74	75	75	77
Common clay	11	15	15	13	13
Fire clay	17	13	13	13	11
Fuller's earth ¹	86	86	89	96	83
Kaolin	144	151	157	160	140
Employment (excludes office workers):					
Mine (may not include contract workers)	1,150	1,130	1,120	1,220	1,110
Mill	4,930	4,730	4,440	4,370	4,360
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Recycling: Insignificant.

Import Sources (2014–17): All clay types combined: Brazil, 78%; Mexico, 7%; United Kingdom, 2%; and other, 13%.

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Tariff: Item	Number	Normal Trade Relations <u>12-31-18</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 val.
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, flower pots, 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: Total U.S. sales of clay in 2018 were essentially unchanged compared with those in 2017. Increases in construction spending and housing starts led to a 3% increase in sales of common clay, but bentonite sales are estimated to have decreased by 13%. Higher kaolin production was likely a result of increased demand for ceramic proppants used by the oil and gas industry.

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

	Bentonite		Mine production Fuller's earth		Kaolin	
	<u>2017</u>	<u>2018^e</u>	<u>2017</u>	<u>2018^e</u>	<u>2017</u>	<u>2018^e</u>
United States	^e 4,300	3,700	^e 11,700	11,600	^e 7,300	7,300
Brazil (beneficiated)	405	400	—	—	2,100	2,000
China	5,600	5,590	—	—	3,200	3,200
Czechia	369	370	—	—	⁷ 3,500	⁷ 3,500
Germany	395	390	—	—	4,300	4,300
Greece	⁷ 1,100	⁷ 1,200	54	56	—	—
India	800	810	6	6	⁷ 4,110	⁷ 4,100
Iran	436	440	—	—	790	790
Mexico	470	460	260	260	330	310
Senegal	—	—	170	190	—	—
Spain	113	100	650	640	⁷ 247	⁷ 260
Turkey	3,140	3,090	—	—	1,900	1,900
Ukraine	210	200	—	—	1,820	1,800
United Kingdom	—	—	—	—	1,010	990
Other countries	<u>3,300</u>	<u>3,800</u>	<u>640</u>	<u>550</u>	<u>6,400</u>	<u>6,600</u>
World total (rounded)	20,600	21,000	13,480	13,300	37,000	37,000

World Resources: 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.