

# BAUXITE AND ALUMINA<sup>1</sup>

(Data in thousand metric dry tons unless otherwise noted)

**Domestic Production and Use:** In 2022, a limited amount of bauxite and bauxitic clay was produced for nonmetallurgical use in Alabama, Arkansas, and Georgia. Production statistics for bauxite were withheld to avoid disclosing company proprietary data. In 2022, the reported quantity of bauxite consumed was estimated to be 2.9 million tons, 4% more than that reported in 2021, with an estimated value of about \$87 million. About 76% of the bauxite was refined by the Bayer process for alumina or aluminum hydroxide, and the remainder went to products such as abrasives, cement, chemicals, proppants, and refractories, and as a slag adjuster in steel mills. Alumina production was estimated to be 1.2 million tons, slightly more than that in 2021. About 63% of the alumina produced went to primary aluminum smelters, and the remainder went to nonmetallurgical products, such as abrasives, ceramics, chemicals, and refractories.

<b><u>Salient Statistics—United States:</u></b>	<b><u>2018</u></b>	<b><u>2019</u></b>	<b><u>2020</u></b>	<b><u>2021</u></b>	<b><u>2022<sup>e</sup></u></b>
<b>Bauxite:</b>					
Production, mine	W	W	W	W	W
Imports for consumption <sup>2</sup>	3,980	4,620	3,760	3,880	3,600
Exports <sup>2</sup>	16	15	15	12	12
Stocks, industry, yearend <sup>e, 2</sup>	600	300	250	200	200
<b>Consumption:</b>					
Apparent <sup>3</sup>	W	W	W	W	W
Reported	4,460	3,680	3,330	2,790	2,900
Price, average unit value of imports, free alongside ship (f.a.s.), dollars per metric ton	31	32	30	31	30
Net import reliance <sup>4</sup> as a percentage of apparent consumption	>75	>75	>75	>75	>75
<b>Alumina:</b>					
Production, refinery <sup>5</sup>	1,570	1,410	1,340	1,180	1,200
Imports for consumption <sup>5</sup>	1,530	1,930	1,340	1,550	2,000
Exports <sup>5</sup>	288	200	153	180	160
Stocks, industry, yearend <sup>5</sup>	275	275	234	202	300
Consumption, apparent <sup>3</sup>	2,800	3,140	2,570	2,580	2,900
Price, average unit value of imports, f.a.s., dollars per metric ton	592	472	394	462	550
Net import reliance <sup>4</sup> as a percentage of apparent consumption	44	55	48	54	59

**Recycling:** None.

**Import Sources (2018–21):** Bauxite:<sup>2</sup> Jamaica, 63%; Brazil, 9%; Guyana and Turkey, 8% each; and other, 12%. Alumina:<sup>5</sup> Brazil, 59%; Australia and Jamaica, 14% each; Canada, 5%; and other, 8%.

<b><u>Tariff:</u></b>	<b><u>Item</u></b>	<b><u>Number</u></b>	<b><u>Normal Trade Relations</u></b> <b><u>12–31–22</u></b>
	Bauxite, calcined (refractory grade)	2606.00.0030	Free.
	Bauxite, calcined (other)	2606.00.0060	Free.
	Bauxite, crude dry (metallurgical grade)	2606.00.0090	Free.
	Aluminum oxide (alumina)	2818.20.0000	Free.
	Aluminum hydroxide	2818.30.0000	Free.

**Depletion Allowance:** 22% (domestic), 14% (foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** In 2022, one domestic alumina refinery produced alumina from imported bauxite. A 1.2-million-ton-per-year alumina refinery in Gramercy, LA, produced alumina for aluminum smelting and specialty-grade alumina. A 500,000-ton-per-year alumina refinery in Burnside, LA, was temporarily shut down in August 2020 and remains idle. No plans were announced regarding reopening its reopening. The average prices, f.a.s., for U.S. imports for consumption of crude dry bauxite and metallurgical-grade alumina during the first 9 months of 2022 were \$30 per ton and \$553 per ton, a slight decrease and 25% more than those in the same period of 2021, respectively.

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The conflict between Russia and Ukraine led to the closure of a 1.7-million-ton-per-year alumina refinery in Ukraine. High energy costs in Europe caused a 600,000-ton-per-year alumina refinery in Romania to temporarily shutter and a 1.7-million-ton-per-year alumina refinery in Spain to curtail production by up to 60%. Additionally, several primary aluminum smelters and aluminum product manufacturers throughout Europe announced shutdowns or partial curtailments. In August, a 1.4-million-ton-per-year alumina refinery in Jamaica resumed operations after a fire in 2021 caused a year-long production stoppage. Operations at a 650,000-ton-per-year alumina refinery in Jamaica were suspended by the National Environment and Planning Agency for polluting a nearby river. A United States-based mining company that mines nonmetallurgical bauxite in Guyana acquired a United States proppant manufacturer with two manufacturing facilities located in Georgia.

**World Alumina Refinery and Bauxite Mine Production and Bauxite Reserves:** Reserves for Australia, China, and Indonesia were revised based company and Government reports.

	Alumina production <sup>5</sup>		Bauxite production		Bauxite reserves <sup>6</sup>
	2021	2022 <sup>e</sup>	2021	2022 <sup>e</sup>	
United States	1,180	1,200	W	W	20,000
Australia	20,400	20,000	103,000	100,000	75,100,000
Brazil	<sup>e</sup> 12,000	11,000	<sup>e</sup> 33,000	33,000	2,700,000
Canada	1,360	1,300	—	—	—
China	75,200	76,000	<sup>e</sup> 90,000	90,000	710,000
Germany	<sup>e</sup> 900	750	—	—	—
Guinea	414	440	<sup>e</sup> 86,000	86,000	7,400,000
India	<sup>e</sup> 7,000	7,400	<sup>e</sup> 17,400	17,000	660,000
Indonesia	<sup>e</sup> 1,000	1,100	<sup>e</sup> 21,000	21,000	1,000,000
Ireland	1,880	1,800	—	—	—
Jamaica	1,160	480	5,950	3,900	2,000,000
Kazakhstan	<sup>e</sup> 1,400	1,400	4,370	4,400	160,000
Russia	3,050	3,100	5,680	5,000	500,000
Saudi Arabia	1,920	2,000	4,780	4,800	180,000
Spain	1,540	1,700	—	—	—
Ukraine	1,770	740	—	—	—
United Arab Emirates	2,300	2,300	—	—	—
Vietnam	1,456	1,500	<sup>e</sup> 3,830	3,800	5,800,000
Other countries	<u>2,620</u>	<u>2,200</u>	<u>9,330</u>	<u>8,900</u>	<u>5,100,000</u>
World total (rounded)	139,000	140,000	<sup>8</sup> 384,000	<sup>8</sup> 380,000	31,000,000

**World Resources:**<sup>6</sup> Bauxite resources are estimated to be between 55 billion and 75 billion tons, distributed in Africa (32%), Oceania (23%), South America and the Caribbean (21%), Asia (18%), and elsewhere (6%). Domestic resources of bauxite are inadequate to meet long-term U.S. demand, but the United States and most other major aluminum-producing countries have essentially inexhaustible subeconomic resources of aluminum in materials other than bauxite.

**Substitutes:** Bauxite is the only raw material used in the production of alumina on a commercial scale in the United States. Although currently not economically competitive with bauxite, vast resources of clay are technically feasible sources of alumina. Other raw materials, such as alunite, anorthosite, coal wastes, and oil shales, offer additional potential alumina sources. Synthetic mullite, produced from kaolin, bauxitic kaolin, kyanite, and sillimanite, substitutes for bauxite-based refractories. Silicon carbide and alumina zirconia can substitute for alumina and bauxite in abrasives but cost more.

<sup>e</sup>Estimated. W Withheld to avoid disclosing company proprietary data. — Zero.

<sup>1</sup>See also the Aluminum chapter. As a general rule, 4 tons of dried bauxite is required to produce 2 tons of alumina, which, in turn, can be used to produce 1 ton of aluminum.

<sup>2</sup>Includes all forms of bauxite, expressed as dry equivalent weights.

<sup>3</sup>Defined as production + imports – exports ± adjustments for industry stock changes.

<sup>4</sup>Defined as imports – exports ± adjustments for industry stock changes.

<sup>5</sup>Calcined equivalent weights.

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

<sup>7</sup>For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 1.7 billion tons.

<sup>8</sup>Excludes U.S. production.