

BAUXITE AND ALUMINA¹

(Data in thousand metric dry tons unless otherwise specified)

Domestic Production and Use: In 2023, a limited amount of bauxite and bauxitic clay was produced for nonmetallurgical use in Alabama, Arkansas, and Georgia. Production statistics were withheld for bauxite and estimated for alumina to avoid disclosing company proprietary data. In 2023, the reported quantity of bauxite consumed was estimated to be 1.8 million tons, 17% less than that reported in 2022, with an estimated value of about \$58 million. About 78% 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 780,000 tons, 15% less than that in 2022. About 68% of the alumina produced went to primary aluminum smelters, and the remainder went to nonmetallurgical products, such as abrasives, ceramics, chemicals, and refractories.

<u>Salient Statistics—United States:</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023^e</u>
Bauxite:					
Production, mine	W	W	W	W	W
Imports for consumption ²	4,620	3,760	3,880	3,630	3,100
Exports ²	16	16	13	10	12
Stocks, industry, yearend ^{e, 2}	300	250	200	200	240
Consumption:					
Apparent ³	W	W	W	W	W
Reported	3,680	3,330	2,790	2,170	1,800
Price, average unit value of imports, free alongside ship (f.a.s.), dollars per metric ton	32	30	31	32	30
Net import reliance ⁴ as a percentage of apparent consumption	>75	>75	>75	>75	>75
Alumina:					
Production, refinery ^{e, 5}	1,400	1,300	1,000	920	780
Imports for consumption ⁵	1,930	1,340	1,550	1,880	1,300
Exports ⁵	200	153	180	174	140
Stocks, industry, yearend ⁵	275	234	202	213	230
Consumption, apparent ³	3,130	2,530	2,410	2,620	1,900
Price, average unit value of imports, f.a.s., dollars per metric ton	472	394	462	518	500
Net import reliance ⁴ as a percentage of apparent consumption	55	49	58	65	59

Recycling: None.

Import Sources (2019–22): Bauxite:² Jamaica, 64%; Turkey, 9%; Guyana, 8%; Australia, 6%; and other, 13%. Alumina:⁵ Brazil, 61%; Australia, 13%; Jamaica, 12%; Canada, 4%; and other, 10%.

<u>Tariff:</u>	<u>Item</u>	<u>Number</u>	<u>Normal Trade Relations</u>
			<u>12–31–23</u>
	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 2023, 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 remained idle in 2023. No plans were announced regarding 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 8 months of 2023 were \$32 per ton and \$501 per ton, 3% more and 8% less than those in the same period in 2022, respectively.

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A U.S. primary aluminum producer acquired a majority stake in a company operating a bauxite mine and a 1.4-million-ton-per-year alumina refinery located in Jamaica. In Europe, high energy costs in 2022 led to the closure and curtailment of alumina refineries, aluminum smelters, and aluminum product manufacturers, which continued into 2023. Ukraine's 1.7-million-ton-per-year alumina refinery remained closed owing to the conflict between Russia and Ukraine. A China-based aluminum producer acquired an Indonesia-based miner with mining rights to three bauxite mines in the Kalimantan Province of Indonesia; one mine has estimated bauxite reserves of 68 million tons of bauxite. China's Shanghai Futures Exchange began selling alumina future contracts after receiving approval from China's securities regulatory commission.

World Alumina Refinery and Bauxite Mine Production and Bauxite Reserves: Reserves for Australia, India, and Russia were revised based on company and Government reports.

	Alumina production ⁵		Bauxite production		Bauxite reserves ⁶
	2022	2023 ^e	2022	2023 ^e	
United States	^e 920	780	W	W	20,000
Australia	19,500	19,000	102,000	98,000	⁷ 3,500,000
Brazil	^e 10,000	10,000	^e 30,000	31,000	2,700,000
Canada	1,360	1,600	—	—	—
China	81,900	82,000	^e 90,000	93,000	710,000
Germany	^e 1,000	720	—	—	—
Greece	861	860	^e 1,200	1,200	—
Guinea	340	330	^e 100,000	97,000	7,400,000
India	^e 7,500	7,300	^e 24,000	23,000	650,000
Indonesia	^e 1,200	1,200	^e 21,000	20,000	1,000,000
Ireland	1,630	1,200	—	—	—
Jamaica	634	1,500	4,370	6,000	2,000,000
Kazakhstan	1,340	1,300	4,400	4,300	160,000
Russia	3,080	2,400	5,780	5,800	480,000
Saudi Arabia	^e 1,900	1,800	^e 4,800	4,600	180,000
Spain	1,340	640	—	—	—
Turkey	300	290	2,800	2,000	63,000
Ukraine	300	—	—	—	—
United Arab Emirates	2,430	2,300	—	—	—
Vietnam	1,430	1,400	^e 3,900	3,700	5,800,000
Other countries	1,200	880	5,900	5,600	5,100,000
World total (rounded)	140,000	140,000	⁸ 400,000	⁸ 400,000	30,000,000

World Resources:⁶ 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.

^eEstimated. W Withheld to avoid disclosing company proprietary data. — Zero.

¹See 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.

²Includes all forms of bauxite, expressed as dry equivalent weights.

³Defined as production + imports – exports ± adjustments for industry stock changes.

⁴Defined as imports – exports ± adjustments for industry stock changes.

⁵Calculated equivalent weights.

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

⁷For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 1.6 billion tons.

⁸Excludes U.S. production.