# BAUXITE AND ALUMINA[1]

(Data in thousand metric dry tons unless otherwise noted)

**Domestic Production and Use:** In 2020, the reported quantity of bauxite consumed was estimated to be 4 million tons, slightly more than that reported in 2019, with an estimated value of about $110 million. About 79% 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. Two domestic Bayer-process refineries with a combined alumina production capacity of 1.7 million tons per year produced an estimated 1.3 million tons in 2020, 8% less than that in 2019. About 56% of the alumina produced went to primary aluminum smelters, and the remainder went to nonmetallurgical products, such as abrasives, ceramics, chemicals, and refractories.

| **Salient Statistics—United States:** | **2016** | **2017** | **2018** | **2019** | **2020[e]** |
|---|---|---|---|---|---|
| Bauxite: | | | | | |
| Production, mine | W | W | W | W | W |
| Imports for consumption[2] | 6,050 | 4,360 | 3,980 | 4,310 | 3,900 |
| Exports[2] | 40 | 29 | 17 | 15 | 17 |
| Stocks, industry, yearend[2] | 880 | 880 | 600 | 300 | 250 |
| Consumption: | | | | | |
| Apparent[3] | W | W | W | W | W |
| Reported | 6,630 | 4,330 | 4,460 | 3,920 | 4,000 |
| Price, average value, U.S. imports, free alongside ship (f.a.s.), dollars per ton | 28 | 31 | 31 | 32 | 27 |
| Net import reliance[4] as a percentage of apparent consumption | >75 | >75 | >75 | >75 | >75 |
| Alumina: | | | | | |
| Production, refinery[5] | 2,360 | 1,430 | 1,570 | 1,410 | 1,300 |
| Imports for consumption[5] | 1,140 | 1,330 | 1,530 | 1,930 | 1,300 |
| Exports[5] | 1,330 | 481 | 288 | 200 | 130 |
| Stocks, industry, yearend[5] | 320 | 264 | 275 | 275 | 200 |
| Consumption, apparent[3] | 2,130 | 2,340 | 2,800 | 3,140 | 2,550 |
| Price, average value, U.S. imports (f.a.s.), dollars per ton | 362 | 486 | 592 | 472 | 370 |
| Net import reliance[4] as a percentage of apparent consumption | E | 38 | 44 | 55 | 49 |

**Recycling:** None.

**Import Sources (2016–19):** Bauxite:[2] Jamaica, 37%; Guyana, 21%; Australia, 16%; Brazil, 11%; and other, 15%. Alumina:[5] Brazil, 47%; Australia, 26%; Jamaica, 12%; Canada, 5%; and other, 10%.

| **Tariff: Item** | **Number** | **Normal Trade Relations 12–31–20** |
|---|---|---|
| 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 2020, two domestic alumina refineries 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, produced specialty-grade alumina until it temporarily shut down in August, citing the COVID-19 pandemic for decreased demand. The average prices free alongside ship (f.a.s.) for U.S. imports for consumption of crude-dry bauxite and metallurgical-grade alumina during the first 8 months of 2020 were $27 per ton, 16% less than that in the same period in 2019, and $370 per ton, 26% less than that in the same period of 2019, respectively.

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# BAUXITE AND ALUMINA

The COVID-19 pandemic was cited for decreased alumina production in China during January and February. Shortages of bauxite and caustic soda were reported at several inland alumina refineries as shipments from ports were delayed because of limited rail and truck service, but deliveries to ports were not interrputed. Alumina prices in China and other parts of the world increased owing to supply shortages and concerns about future availablity during the first quarter of the year. Coal deliveries to some refineries also slowed. Health officials in China imposed travel and work restrictions in parts of the country most affected by the COVID-19 virus to contain it, and in other regions, higher rates of absenteeism were attribuited to concerns about the virus. In March, many of the travel restrictions were lifted and alumina production restarted. Despite the temporary shutdowns, production in China increased.

In February, a 1.7-million-ton-per-year bauxite mine in Guyana shut down, citing civil unrest that interfered with mining operations and damaged mine property. The mine was a major supplier of refractory-grade bauxite. Bauxite and alumina production increased in Brazil compared with that in 2019 after the restart of capacity that was shut down for most of 2019. In August, a 9.9-million-ton-per-year bauxite mine in Brazil temporarily shut down production, citing damage to the pipeline used to transport bauxite to an alumina refinery. Routine inspection of the pipeline dicovered that it had deteriorated more than expected and it was shut down immediately for repair. The repair work was completed and the mine restarted production in October. Production from the 6.3-million-ton-per-year alumina refinery was decreased to 35% to 40% of its capacity, a rate of 2.2 to 2.5 million tons per year, until the pipeline was repaired.

**World Alumina Refinery and Bauxite Mine Production and Bauxite Reserves:** Reserves for Australia, Brazil, Malaysia, and Saudi Arabia were revised based on information from Government and other sources.

| | Mine production | | | | Bauxite reserves[6] |
|---|---|---|---|---|---|
| | Alumina[5] | | Bauxite | | |
| | 2019 | 2020[e] | 2019 | 2020[e] | |
| United States | 1,410 | 1,300 | W | W | 20,000 |
| Australia | 20,200 | 21,000 | 105,000 | 110,000 | [7]5,100,000 |
| Brazil | 8,700 | 9,600 | 34,000 | 35,000 | 2,700,000 |
| Canada | 1,520 | 1,500 | — | — | — |
| China | 72,500 | 74,000 | 70,000 | 60,000 | 1,000,000 |
| Guinea | 368 | 460 | 67,000 | 82,000 | 7,400,000 |
| India | 6,690 | 6,700 | 23,000 | 22,000 | 660,000 |
| Indonesia | 1,000 | 1,000 | 17,000 | 23,000 | 1,200,000 |
| Jamaica | 2,170 | 1,700 | 9,020 | 7,700 | 2,000,000 |
| Kazakhstan | 1,500 | 1,500 | 5,800 | 5,800 | 160,000 |
| Malaysia | — | — | 900 | 500 | 170,000 |
| Russia | 2,760 | 2,800 | 5,570 | 6,100 | 500,000 |
| Saudi Arabia | 1,840 | 1,800 | 4,050 | 4,000 | 190,000 |
| Vietnam | 1,370 | 1,400 | 4,000 | 4,000 | 3,700,000 |
| Other countries | 10,900 | 12,000 | 12,000 | 11,000 | 4,900,000 |
| World total (rounded) | 133,000 | 136,000 | [8]358,000 | [8]371,000 | 30,000,000 |

**World Resources:**[6] Bauxite resources are estimated to be 55 billion to 75 billion tons, 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 abrasives but cost more.

[e]Estimated. E Net exporter. W Withheld to avoid disclosing company proprietary data. — Zero.

[1]See also Aluminum. As a general rule, 4 tons of dried bauxite is required to produce 2 tons of alumina, which, in turn, produces 1 ton of aluminum.

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

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

[4]Defined as imports – exports + adjustments for industry stock changes.

[5]Calcined equivalent weights.

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

[7]For Australia, Joint Ore Reserves Committee-compliant reserves were 2.2 billion tons.

[8]Excludes U.S. production.