

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

(Data in thousand metric dry tons, unless otherwise noted)

**Domestic Production and Use:** Domestic ore, which for many years has accounted for less than 1% of the U.S. requirement for bauxite, was mined by one company from surface mines in Alabama and Georgia; virtually all of it was used in the production of nonmetallurgical products, such as abrasives, chemicals, and refractories. Thus, nearly all bauxite consumed in the United States was imported; of the total, about 95% was converted to alumina. Also, the United States imported more than one-half of the alumina it required. Of the total alumina used, about 90% went to primary aluminum smelters and the remainder went to nonmetallurgical uses. Annual alumina capacity was 5.1 million tons, with four Bayer refineries in operation at midyear.

<b>Salient Statistics—United States:</b> <sup>2</sup>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000<sup>e</sup></b>
Production, bauxite, mine	W	NA	NA	NA	NA
Imports of bauxite for consumption <sup>3</sup>	10,800	11,300	11,600	10,400	9,300
Imports of alumina <sup>4</sup>	4,330	3,830	4,050	3,810	4,500
Exports of bauxite <sup>3</sup>	154	97	108	168	180
Exports of alumina <sup>4</sup>	918	1,270	1,280	1,230	1,000
Shipments of bauxite from Government stockpile excesses <sup>3</sup>	612	1,430	3,300	4,180	500
Consumption, apparent, bauxite and alumina (in aluminum equivalents) <sup>5</sup>	4,380	4,210	5,000	4,880	4,200
Price, bauxite, average value U.S. imports (f.a.s.) dollars per ton	27	25	23	22	24
Stocks, bauxite, industry, yearend <sup>9</sup>	1,930	2,260	1,860	1,440	1,000
Net import reliance, <sup>6</sup> bauxite and alumina, as a percent of apparent consumption	100	100	100	100	100

**Recycling:** None.

**Import Sources (1996-99):**<sup>7</sup> Bauxite: Guinea, 39%; Jamaica, 29%; Brazil, 16%; Guyana, 9%; and other, 7%. Alumina: Australia, 69%; Suriname, 10%; Jamaica, 8%; and other, 13%. Total: Australia, 31%; Guinea, 22%; Jamaica, 20%; Brazil, 10%; and other, 17%.

**Tariff:** Import duties on bauxite and alumina were abolished in 1971 by Public Law 92-151. Only imports from non-normal-trade-relations nations were dutiable. Countries that supplied commercial quantities of bauxite or alumina to the United States during the first 8 months of 2000 had normal-trade-relations status.

**Depletion Allowance:** 22% (Domestic), 14% (Foreign).

### **Government Stockpile:**

<b>Material</b>	<b>Stockpile Status—9-30-00<sup>8</sup></b>				
	<b>Uncommitted inventory</b>	<b>Committed inventory</b>	<b>Authorized for disposal</b>	<b>Disposal plan FY 2000</b>	<b>Disposals FY 2000</b>
Bauxite, metal grade:					
Jamaica-type	5,500	3,640	5,500	2,030	2,040
Suriname-type	820	2,310	820	1,520	1,520
Bauxite, refractory-grade, calcined	45	28	45	0	0

**Events, Trends, and Issues:** World production of bauxite was essentially unchanged from that of 1999. World production of alumina, however, increased slightly to accommodate the modest increase in world primary aluminum metal production.

Domestic alumina production decreased owing to the continued closure of Kaiser Aluminum & Chemical Corp.'s 1.05-million-ton-per-year Gramercy, LA, refinery. Reconstruction of the area of the plant damaged during an explosion on July 5, 1999, continued. Kaiser expected to complete the first phase of its restart by yearend 2000 and to have the facility operating at full capacity in the first quarter of 2001.<sup>9</sup>

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The revised fiscal year (FY) Annual Materials Plan (AMP) submitted by the Defense National Stockpile Center proposed the sale of 3.05 million dry metric tons of metallurgical-grade bauxite (2.03 million tons of Jamaica-type and 1.02 million tons of Suriname-type) during the period October 1, 2000, to September 30, 2001. These are the maximum amounts that could be sold under the FY 2001 AMP, and are not necessarily the amounts that would actually be offered for sale.

Spot prices for metallurgical-grade alumina, as published by Metal Bulletin, increased slightly during the first 2 months of the year, and held steady for a few months, before beginning a precipitous decline that began in mid-May. The decline was attributed in part to announced smelter closures in the United States, a general slowdown in the growth of metal demand, and increased alumina production as refinery capacity expansions came on-stream. The published price range began the year at \$375 to \$385 per ton. In mid-February, the price range reached \$420 to \$440 per ton and held steady until mid-May. By the end of September, the price range had declined to \$190 to \$205 per ton.

### World Bauxite Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves <sup>10</sup>	Reserve base <sup>10</sup>
	1999	2000 <sup>e</sup>		
United States	NA	NA	20,000	40,000
Australia	48,400	49,000	3,800,000	7,400,000
Brazil	12,900	13,200	3,900,000	4,900,000
China	8,500	8,000	720,000	2,000,000
Guinea	15,000	15,000	7,400,000	8,600,000
Guyana	3,300	3,300	700,000	900,000
India	6,200	6,200	1,500,000	2,300,000
Jamaica	11,700	11,200	2,000,000	2,500,000
Russia	3,750	3,900	200,000	250,000
Suriname	4,000	4,000	580,000	600,000
Venezuela	4,190	4,400	320,000	350,000
Other countries	9,200	8,900	4,100,000	4,700,000
World total (rounded)	127,000	127,000	25,000,000	35,000,000

**World Resources:** Bauxite resources are estimated to be 55 to 75 billion tons, located in South America (33%), Africa (27%), Asia (17%), Oceania (13%), and elsewhere (10%). Domestic resources of bauxite are inadequate to meet long-term 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. However, the vast U.S. resources of clay are technically feasible sources of alumina. Other domestic raw materials, such as anorthosite, alunite, coal wastes, and oil shales, offer additional potential alumina sources. Although it would require new plants using new technology, alumina from these nonbauxitic materials could satisfy the demand for primary metal, refractories, aluminum chemicals, and abrasives. Synthetic mullite, produced from kyanite and sillimanite, substitutes for bauxite-based refractories. Although more costly, silicon carbide and alumina-zirconia substitute for bauxite-based abrasives.

<sup>e</sup>Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

<sup>1</sup>See also Aluminum. As a general rule, 4 tons of dried bauxite are required to produce 2 tons of alumina, which, in turn, provide 1 ton of primary aluminum metal.

<sup>2</sup>Includes U.S. Virgin Islands.

<sup>3</sup>Includes all forms of bauxite, expressed as dry equivalent weights.

<sup>4</sup>Calcined equivalent weights.

<sup>5</sup>The sum of U.S. bauxite production and net import reliance (all in aluminum equivalents).

<sup>6</sup>Defined as imports - exports + adjustments for Government and industry stock changes (all in aluminum equivalents). Treated as separate commodities, the net import reliance equaled 100% for bauxite and 44% for alumina in 2000. For the years 1996-99, the net import reliance was 100% for bauxite and ranged from 33% to 42% for alumina.

<sup>7</sup>Aluminum equivalents.

<sup>8</sup>See Appendix B for definitions.

<sup>9</sup>Kaiser Aluminum & Chemical Corp., 2000, Kaiser Aluminum revises start-up schedule for Gramercy alumina refinery: Houston, TX, Kaiser Aluminum & Chemical Corp. press release, September 18, 1 p.

<sup>10</sup>See Appendix C for definitions.