

## 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 about half of the alumina it required. Of the total alumina used, about 90% went to primary aluminum smelters and the remainder to nonmetallurgical uses. Annual alumina capacity was 6.2 million tons, with four Bayer refineries in operation at yearend.

<b>Salient Statistics—United States:</b> <sup>2</sup>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997<sup>e</sup></b>
Production, bauxite, mine	W	W	W	NA	NA
Imports of bauxite for consumption <sup>3</sup>	11,900	11,200	10,800	10,700	11,200
Imports of alumina <sup>4</sup>	3,940	3,120	4,000	4,320	4,200
Exports of bauxite <sup>3</sup>	92	137	120	154	100
Exports of alumina <sup>4</sup>	1,240	1,040	1,040	918	1,200
Shipments of bauxite from Government stockpile excesses	565	5	874	612	750
Consumption, apparent, bauxite and alumina (in aluminum equivalents) <sup>5</sup>	4,510	3,840	4,330	4,360	4,300
Price, bauxite, average value U.S. imports (f.a.s.) dollars per ton	28	26	24	27	27
Stocks, bauxite, industry, yearend	1,600	1,600	1,730	2,060	2,000
Net import reliance, <sup>6</sup> bauxite and alumina as a percent of apparent consumption	100	99	99	100	100

**Recycling:** None.

**Import Sources (1993-96):**<sup>7</sup> Bauxite: Guinea, 37%; Jamaica, 29%; Brazil, 16%; Guyana, 10%; and other, 8%. Alumina: Australia, 70%; Jamaica, 9%; Suriname, 8%; and other, 13%. Total: Australia, 31%; Guinea, 21%; Jamaica, 20%; Brazil, 9%; and other, 19%.

**Tariff:** Import duties on bauxite and alumina were abolished in 1971 by Public Law 92-151. Only imports from non-most-favored nations were dutiable. Countries that supplied commercial quantities of bauxite or alumina to the United States during the first 7 months of 1997 had most-favored-nation status.

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

### **Government Stockpile:**

Material	Stockpile Status—9-30-97 <sup>8</sup>				
	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1997	Disposals FY 1997
Bauxite, metal grade:					
Jamaica-type	9,890	659	9,710	610	610
Suriname-type	4,250	704	4,250	305	310
Bauxite, refractory-grade, calcined	92	65	22	81	<sup>9</sup> 62

## BAUXITE AND ALUMINA

**Events, Trends, and Issues:** World output of bauxite and alumina for 1997 increased slightly to accommodate the modest increase in world primary aluminum metal production.

U.S. alumina plant engineered capacity remained essentially unchanged from that of yearend 1996. The 600,000-ton-per-year alumina plant in St. Croix, VI, remained idle.

Spot prices for metallurgical-grade alumina, as published by Metal Bulletin, fluctuated during 1997. The published price range began the year at \$150 to \$160 per ton. The price increased during the first quarter to \$225 to \$245 per ton. By the end of the second quarter, the price has decreased to \$195 to \$205 per ton. The price range again reversed direction and gradually increased during the third quarter to reach \$210 to \$230 per ton on October 1.

The fiscal year (FY) Annual Materials Plan (AMP) submitted by the Defense National Stockpile Center proposed the sale of 915,000 dry metric tons of metallurgical-grade bauxite (610,000 tons of Jamaica-type and 305,000 tons of Suriname-type) during the period October 1, 1997 to September 30, 1998. In addition, the FY 1998 AMP provided for the sale of 81,000 calcined metric tons of refractory-grade bauxite from the National Defense Stockpile. These are the maximum amounts that could be sold under the new AMP and not necessarily the amounts that would actually be offered for sale.

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

	Mine production		Reserves <sup>10</sup>	Reserve base <sup>10</sup>
	1996	1997 <sup>e</sup>		
United States	NA	NA	20,000	40,000
Australia	43,100	43,500	5,600,000	7,900,000
Brazil	9,700	9,700	2,800,000	2,900,000
China	6,200	7,000	720,000	2,000,000
Guinea	14,000	14,000	5,600,000	5,900,000
Guyana	2,000	2,000	700,000	900,000
India	5,100	5,500	1,000,000	1,200,000
Jamaica	11,829	12,000	2,000,000	2,000,000
Russia	3,300	3,300	200,000	200,000
Suriname	4,000	4,000	580,000	600,000
Venezuela	5,600	5,600	320,000	350,000
Other countries	8,928	8,900	3,800,000	4,400,000
World total (rounded)	114,000	115,000	23,000,000	28,000,000

**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, provides 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).

<sup>7</sup>Aluminum equivalents.

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

<sup>9</sup>Dry equivalent weight—95,800 metric tons.

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