

BAUXITE AND ALUMINA

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Total world output of bauxite and alumina decreased during 1994, owing to a market oriented cutback in the worldwide production of primary aluminum metal, with bauxite production dropping by approximately 1% and alumina output decreasing by 3%. Mine production of bauxite was reported from 27 countries. Alumina reportedly was produced in 29 countries around the world.

U.S. mine production of bauxite increased in 1994; nevertheless, imports continued to dominate the domestic market. In 1994, U.S. bauxite mine production once again amounted to less than 1% of total world production, and this domestic output was used exclusively for nonmetal applications. U.S. consumption of bauxite in 1994 dropped by about 2% below 1993 consumption levels. This downturn in domestic consumption was felt across all industrial sectors. Similarly, demand for alumina remained sluggish throughout the year, mainly in response to reduced primary aluminum smelter operating levels. U.S. production of smelter-grade alumina in 1994 decreased by 10% and shipments from domestic production facilities likewise declined by a similar amount. This decrease in U.S. production and shipments of alumina, in combination with a decline in imports for consumption of alumina into the United States, resulted in an approximately 1.2 million metric ton drop in domestic alumina supply compared with 1993.

Identified world bauxite resources (reserves plus subeconomic and undiscovered deposits) at yearend 1994 were estimated by the U.S. Geological Survey to be 55 to 75 billion tons, located in South America (33%), Africa (27%), Asia (17%), Oceania (13%), and elsewhere (10%). The reserve base was estimated by the U.S. Bureau of Mines (USBM) at 28 billion tons and reserves at 23 billion tons. (See table 1.)

Legislation and Government Programs

There were no additions of bauxite to the National Defense Stockpile (NDS) in 1994. In September 1994, the Defense Logistics Agency (DLA) released its new Annual Materials Plan (AMP) for fiscal year 1995. The new AMP, which went into effect on October 1, 1994, provided for the sale of 900,000 long dry tons

(915,000 metric dry tons) of metallurgical-grade bauxite; 600,000 long dry tons (610,000 metric dry tons) of Jamaica type; and 300,000 long dry tons (305,000 metric dry tons) of Suriname type. Additionally, as a part of this program, the DLA was authorized to dispose of 80,000 long calcined tons (81,000 metric calcined tons) of refractory-grade bauxite in fiscal year 1995. These were the maximum amounts recommended for disposal during the fiscal year, and the actual level of sales were dependent upon prevailing market conditions. Under provisions of this new AMP, DLA announced plans to issue a consolidated long-term solicitation for a group of eight commodities, including 50,000 long calcined tons (51,000 metric calcined tons) of refractory-grade bauxite.

At yearend 1994, Stockpile holdings for metallurgical-grade bauxite were: 11.6 million tons of Jamaica-type and 5.0 million tons of Suriname-type, with both amounts authorized by the Congress for ultimate disposal. The NDS calcined refractory-grade bauxite inventory was listed as 228,000 tons, with 154,000 tons authorized for ultimate disposal.

Production

U.S. bauxite production approximately doubled in 1994. Nevertheless, it once again amounted to less than 1% of total world production, and was used exclusively for nonmetal products such as abrasives, chemicals, proppants, and refractories. Domestic production and consumption data for bauxite and alumina were obtained by the USBM from three separate, voluntary surveys of U.S. operations. Typical of these quarterly and annual surveys is the "Consumption of Alumina" survey, sent in 1994 to 27 operations, 26 of which responded.

The only active bauxite mines remaining in the U.S. are the surface operations in Alabama and Georgia that produce bauxitic materials, a natural mixture of bauxitic clay and bauxite with a very low iron oxide content, used primarily for the production of alumina calcines. Demand for these domestic ores declined slightly during 1994. Within this market sector, the Harbison-Walker Refractories Division of INDRESCO Inc. shipped bauxite from mines in Alabama to its local calcining

plant and to Carbo Ceramic Co.'s proppant plant at Eufaula, AL. Throughout the year, C-E Minerals continued to operate and maintain its mines in Alabama and Georgia, shipping the raw ore to its Andersonville, GA, facility for the production of refractory products.

Annual alumina production from the five Bayer-process alumina plants operating in the United States during 1994 was about 4.9 million tons, a drop of approximately 8% below 1993 output.

In an effort to reduce production costs and improve plant efficiencies, Alcoa's Industrial Chemicals Division announced plans to make a multimillion dollar investment in reengineering its aluminum trihydrate (ATH) production facility at Bauxite, AR. This planned specialty alumina chemical plant modernization scheme involved shortening of facility cycle times, expansion of ATH capacity by more than 25%, and a total upgrade of production efficiency, quality, and consistency. Construction of the modernized facilities was scheduled to begin in late 1994 or early 1995, with the expansion expected to come on-line in late 1995 or early 1996.¹

Later in 1994, the Aluminum Company of America (Alcoa) and Western Mining Corporation Holdings (WMC) of Australia signed the final agreements to combine their bauxite/alumina and chemical interests into a worldwide joint venture beginning on January 1, 1995. It was expected that the new business enterprise would have annual revenues of nearly \$3 billion, with Alcoa owning 60% and WMC 40% of the new enterprise. Alcoa's principal U.S. based alumina and chemical production facilities include its Point Comfort, TX, alumina production plant and specialty alumina chemical facility at Bauxite, AR.

On November 30th, Glencore AG announced that it would temporarily close its Virgin Island Alumina Corp. plant at St. Croix, VI, by yearend. The company indicated it planned to keep the alumina production facility in operational readiness in order that a relatively rapid restart could be achieved once alumina market conditions improved; however, the plant was not expected to reopen for at least 1 year.

As in the past several years, Reynolds Metals Co. indicated that its 1.7-million-ton-per-year capacity Sherwin alumina plant, near Corpus Christi, TX,

operated at a reduced production level in 1994. This was a result of the company's effort to balance its alumina supply system with the operation of its U.S. primary aluminum production facilities. At yearend 1994, the Sherwin plant was reported to be operating at 65% of its annual rated capacity. (See tables 2 and 3.)

Consumption

Weak demand for smelter-grade alumina lowered the consumption of crude and dried metallurgical-grade bauxite in 1994. Consumption of bauxite by the abrasive industry decreased by nearly 3% in 1994, consumption by the chemical industry was down by 15%, and use in the refractory industries dropped by 10%. Approximately 93% of the bauxite consumed in the United States during 1994 was refined to alumina, and an estimated average of 2.23 tons of dried bauxite was required to produce 1 ton of calcined alumina. Twenty-two primary aluminum smelters reported a consumption of 6.78 million tons of calcined alumina in 1994, a 9% decrease from the consumption level reported for 1993. This reduced demand resulted in correspondingly lower levels of U.S. alumina production and imports for consumption. Nevertheless, an estimated 90% of the alumina shipped by U.S. alumina plants went to domestic primary smelters for aluminum metal production. Consumption in various forms by the abrasives, chemicals, refractories, and specialties industries accounted for the remainder of the U.S. alumina usage. (See tables 4, 5, 6, and 7.)

Prices

Contract terms for the purchase of metallurgical-grade bauxite and smelter-grade alumina in world markets are not normally made public, and, consequently, contract prices for these commodities are not published by trade journals. Recently, spot or market price estimates for metallurgical-grade alumina have begun to appear in some industry publications, but the majority of published price quotes are limited to certain specialty forms of bauxite and alumina for nonmetallurgical applications.

In 1994, the USBM estimated the average value of domestic crude bauxite shipments, f.o.b. mine or plant, to be \$19 per ton. The average value of calcined domestic bauxite was estimated to have once again remained in the \$195 to \$200 per ton range. Base prices quoted by *Industrial Minerals* magazine and independent sources for imported calcined refractory grade bauxite were as follows:

Chinese, minimum 87% alumina (Al_2O_3), f.o.b. Chinese ports, \$85 to \$95 per ton; Guyanese, f.o.b. rail car, Baltimore, MD, or f.o.b. barge, Gulf Coast, \$175 ton. Abrasive grade bauxite, minimum 86% Al_2O_3 , c.i.f. main European ports, was priced at \$95 to \$108 per ton. Base prices were subject to adjustment for various grain-size specifications, size of order, and fuel cost factors.

Surplus levels of alumina supply developed throughout the world, which resulted in spot or market prices for alumina languishing at depressed levels until yearend 1994, when market conditions began to improve. Metallurgical-grade alumina spot prices on international markets ended the year at about the \$127 to \$130 per ton, which was up somewhat from the lows of \$115 to \$117 per ton that occurred earlier in the year and well below the high levels previously achieved in the early 1990's. The average value of domestic calcined alumina shipments was estimated to be \$184 per ton. Trade data released by the U.S. Bureau of the Census indicated the average value of imported calcined alumina was \$182 per ton, f.a.s. port of shipment, and \$194 per ton, c.i.f. U.S. ports. Beyond the depressed spot prices of 1994, medium term projections support a reasonably resilient market outlook for alumina toward the close of the 1990's. (See table 8.)

Foreign Trade

Dried bauxite exports from the United States totaled 114,000 tons in 1994, a major increase over the 1993 total of 85,000 tons; Canada received 99% of these 1994 exports. U.S. exports of calcined refractory-grade bauxite totaled 10,500 tons for 1994; Mexico received 44% and Canada 35%. Exports of all other grades of calcined bauxite (chiefly abrasive grade) amounted to 4,490 tons for the year, with Canada receiving 58% of these shipments in 1994. Specialty aluminum compounds exported included 7,060 tons of aluminum sulfate, 11,000 tons of aluminum chloride, 12,700 tons of aluminum oxide abrasives, and 16,100 tons of various fluoride-based compounds of aluminum, including synthetic cryolite and aluminum fluoride.

Imports for consumption of crude and dried bauxite decreased by 8% from the level of 1993 receipts, and the four principal suppliers, Guinea, Jamaica, Brazil, and Guyana, in order of shipments, provided 95% of the total. As in previous years, China and Guyana remained the dominant suppliers of calcined bauxite to the United States. Australia continued to be the primary source of U.S. alumina imports, accounting for slightly more than 65% of the total receipts for 1994. (See tables 9, 10, 11,

and 12.)

World Review

World production of bauxite and alumina decreased in response to a market oriented cutback in the worldwide production of primary aluminum metal and a continued flow of aluminum from the republics of the former Soviet Union (FSU) onto the world market. Twenty-seven countries mined bauxite in 1994, and total world production amounted to about 107 million tons, slightly below that mined in 1993. This estimate is based on newly acquired information available following the dissolution of the Eastern bloc and a correspondingly more accurate accounting of total world production of aluminum industry feedstocks. Australia, Guinea, Jamaica, and Brazil, in order of volume, accounted for slightly more than 70% of the total bauxite mined during 1994. The corresponding world output of alumina dropped to 42 million tons, which was about 3% below that of 1993. The four principal producing countries, Australia, the United States, Jamaica, and Russia, in order of volume, supplied approximately 56% of the total world production.

The 1994 world annual rated capacity of plants producing alumina increased by only 3% over the previous year's level, but was nearly 16% above that of 1984. At the same time, apparent worldwide refinery capacity utilization for 1994 was estimated at approximately 85%, a decrease of about 5% from the previous year. As has been the case in recent years, further increases in smelter-grade alumina production capacity are expected to develop principally from incremental expansions of existing plants and only in very special situations from new greenfield refineries, which normally demand a 4- to 5-year design, engineering, and construction period, plus very significant levels of capital investment.

The International Bauxite Association (IBA), created in 1974 by the leading bauxite producing countries of the time, was disbanded at yearend 1994. The decision to dissolve the 20-year old organization followed an extended period of uncertainty regarding the future of the group, caused primarily by the recent loss of several key member countries and increasing funding problems.

Australia.—In 1994, production levels rose in this, the world's largest bauxite and alumina producing country. Bauxite output was up by nearly 1% and alumina increased by 2%.

Australia's alumina exports to Russia in 1994 were projected to leap to 600,000 tons, up from the 25,000 tons reportedly shipped in 1993, following agreements established

between Alcoa of Australia Ltd. and Comalco Ltd. and a group of Siberian aluminum smelters. Under the agreements, the two Australian alumina producers contracted to deliver smelter-grade alumina worth \$147 million (A\$200 million) to as many as six Siberian primary aluminum production facilities in 1994.²

In another Australian development, it was announced that ACAP-Australia Pty. Ltd., a joint venture between Alcoa's Industrial Chemicals Division and Alcoa of Australia, planned to construct a 270,000-ton-per-year aluminum trihydrate (ATH) facility at Alcoa's Kwinana alumina plant in Western Australia. It was planned that this new \$29.1 million (A\$42.9 million) ATH production expansion would be brought on-stream in two stages, the first to be completed by the fourth-quarter of 1994 and the second-quarter in 1995.³

Additionally, Alcoa of Australia indicated that it was considering expanding alumina production at its Wagerup alumina plant in Western Australia. The company has commenced an Environmental Review Process which, if approved, would allow it to expand Wagerup's annual production capacity to 3.3 million tons per year, approximately twice its current capacity. It was suggested that the final approval from the Western Australian state government on the environmental aspects of this possible expansion could take up to 2 years.⁴

Brazil.—It was announced that Mineração Rio do Norte (MRN), Brazil's largest bauxite producer, would invest \$230 million to increase output from 8 million tons per year to 12 million tons per year at its Trombetas bauxite mining operation in the Amazon Basin. The purpose of this investment was to insure that sufficient metallurgical-grade bauxite would be available when the new 1.1-million-ton-per-year greenfield Alunorte alumina plant being constructed near Belem, Pará, becomes operational in 1995.⁵

China.—The Shanxi aluminum smelter complex reportedly completed a successful trial run of its new \$45 million alumina plant expansion, scheduled to come on-stream by yearend 1994. This second-stage expansion will bring the Shanxi facility's annual alumina production capacity up to 1.2 million tons per year and make Shanxi the largest alumina producer in China.⁶

Ghana.—Reports indicated that the Ghana Bauxite Co. (GBC) was considering a plan to build an aluminum sulfate plant to supply western Africa's water treatment industries. The GBC joint venture is owned by Alcan Chemicals Europe (45%) and the government of Ghana (55%).⁷

Hungary.—It was reported that the

Hungarian aluminum producer, Hungalu, permanently closed its 330,000-ton-per-year Almafuzito alumina plant in early November. This plant closure also resulted in the cessation of bauxite mining operations at Csabpuszta, Nyirad District, in the latter part of 1994.⁸

India.—Alcoa and Larsen & Toubro Ltd., a Bombay-based engineering company, agreed to study the feasibility of forming a joint venture to construct a bauxite mining and alumina refining complex in the state of Orissa in India. The proposed greenfield project, with an estimated cost of about \$700 million, would produce 1 million tons of alumina per year for export.⁹

In addition, India's private-sector Hindustan Aluminium Corp. Ltd. (Hindalco) has entered into a technology assistance agreement with Reynolds Metals Co. to increase the alumina production capacity of its alumina plant at Renukoot, Uttar Pradesh, from 350,000 tons per year to 450,000 tons per year.¹⁰

In a similar development, Indian Aluminium Co. (Indal), Tata Industries Ltd., India's largest business group, and Norsk Hydro of Norway agreed to build and jointly operate a 1-million-ton-per-year alumina plant in India's eastern state of Orissa. Construction of the alumina plant was expected to start in 1995 and, once in operation, all production would be exported to international markets. A bauxite mine reportedly had been leased by Indal and was being developed by Utkal Alumina International Private Ltd., the joint-venture company formed to manage the alumina project.¹¹

Despite this flurry of future expansion plans, late in 1994, National Aluminium Co., Ltd. (Nalco) announced plans to reduce its alumina production by 10% due to low demand. In the 1993-94 business year, Nalco reportedly produced 753,000 tons of alumina, 372,000 tons of which were shipped to export markets.¹²

Jamaica.—Due to depressed international prices for aluminum metal, the Kaiser Jamaica Bauxite Co. announced plans to reduce its bauxite production by 500,000 tons for the year, an approximate 15% drop in annual output.¹³

In a further development, the Jamaica Bauxite Institute (JBI) continued work on a feasibility study to establish a 1-million-ton-per-year greenfield alumina plant in the Parish of Trelawny on the north coast of Jamaica. JBI conducted field work and exploration drilling to confirm bauxite reserves for the intended plant. It was estimated that 2.5 million tons of metallurgical-grade bauxite would be required to feed this facility.¹⁴

Kazakhstan.—Bauxite occurrences were included among the designated properties

offered in the Republic of Kazakhstan's first official international minerals and metals tender that occurred at mid-year. A total of 40 mineral and metal properties were included in this solicitation, which sought applications from the international exploration and mining community to evaluate and participate in the development of Kazakhstan's mineral resources.

Russian Federation.—A significant development in the former Soviet Union (FSU) involved the announcement that the first stage of a new bulk unloading terminal for the handling of alumina had been successfully installed and commissioned in early 1994 at Vanino, a seaport in Russia's Far East. The opening of this east coast transshipment facility marked a major attempt to clear one of the principal raw materials supply bottlenecks that has hampered the large hydroelectric powered Russian aluminum smelters in the remote regions of Siberia. This new bulk alumina handling terminal was jointly owned by Trans-World Metals, a trading group based in the United Kingdom, and the Vanino Port Authority, a new Russian joint stock company. A second stage expansion was also reportedly scheduled to commence operation within 3 months of the terminal's initial startup and should lift the bulk alumina handling capacity at Vanino to 50,000 tons per month.¹⁵

In a related matter, news reports indicated that construction was scheduled to begin in mid-1994 on a new 1-million-ton-per-year alumina transshipment facility at the seaport of Murmansk, in northwestern Russia. This proposed new bulk handling terminal reportedly was designed to include two pneumatic unloaders, a conveyor system, two 16,000-ton storage silos, and a rail car loader.¹⁶

Saudi Arabia.—In a continuing attempt to develop a locally derived source of feed for the Persian Gulf region's aluminum industry, Saudi Arabia solicited bids for a feasibility study covering the construction of an open pit mining operation at its Az Zabirah bauxite deposit. Estimates currently place known minable reserves of the Az Zabirah deposit at 102 million tons.¹⁷

South Africa.—During the year, Gencor Ltd. of South Africa finalized its purchase of the minerals and metals operations owned by Billiton, a subsidiary of the Royal Dutch/Shell Group. The final purchase price reportedly agreed upon for the assets was \$1.14 billion after a \$15 million cash investment in Billiton's bauxite and alumina operations in Suriname. This wide ranging agreement encompassed exploration, mining, processing, and marketing assets in 15 different countries comprising alumina, aluminum, bauxite, copper, gold, nickel, and zinc.¹⁸ (See tables 13 and 14.)

Outlook

Presently identified world bauxite reserves are sufficient to meet cumulative world demand well into the next century. Considering the high probability of discovering additional bauxite deposits, plus the added possibility of employing lower grade bauxite occurrences and various alternative sources of alumina, world resources of aluminum remain adequate to satisfy demand for the foreseeable future.

The continued and extended economic restructuring of Eastern Europe and the newly independent republics of the FSU provide significantly increased market opportunities for the established bauxite- and alumina-producing countries of the world. The quality and quantity of bauxite resources within the former Eastern bloc nations are incapable of sustaining an economically viable market-based aluminum industry. To become truly competitive in the "new global economy," major amounts of imported bauxite and alumina feedstocks will be required to supply the primary aluminum production facilities of the FSU. The most crucial element in the development of this trade pattern will be the implementation of adequate and reliable payment or tolling mechanisms for the continued timely transfer of these vital raw materials to the aluminum industry of the FSU.

In 1994, metallurgical-grade bauxite and alumina markets were markedly weakened by a worldwide reduction in primary aluminum metal production. Although, at the close of the year, the outlook for the producers of these aluminum industry feedstocks appeared to substantially improve, with the prospect of the possible restarting of several previously idled aluminum smelters and the expected commissioning of additional greenfield primary aluminum metal production capacity in 1995. Currently, both the short- and long-term growth prospects for bauxite and alumina are believed to be rather robust and a bright future is forecast for these aluminum industry raw materials. This projection is based on the belief that the current worldwide economic expansion will continue well into the latter portion of the decade and create an increased demand for aluminum metal in the late 1990's.

¹Industrial Minerals. Alcoa Reengineers Alumina Hydrates Plant. No. 327, Dec. 1994, pp. 16-17.

²American Metal Market. Siberian Smelters Get Aussie Alumina. V. 102, No. 136, July 18, 1994, p. 6.

³Industrial Minerals. Alcoa Sets Up ATH Plant. No. 318, Mar. 1994, p. 8.

⁴Metal Bulletin. Alcoa to Expand Wagerup Alumina Plant. No. 7904, Aug. 11, 1994, p. 5.

⁵American Metal Market. MRN Planning Bauxite

Expansion. V. 102, No. 167, Aug. 30, 1994, p. 7.

⁶Platt's Metals Week. Shanxi Alumina Plant Begins Test Operation. V. 65, No. 35, Aug. 29, 1994, p. 5.

⁷Mining Journal. Ghanaian Bauxite Proposal. V. 323, No. 8295, Sept. 30, 1994, p. 237.

⁸———. Hungary's Alumina Demise. V. 323, No. 8300, Nov. 4, 1994, p. 322.

⁹Alcoa Daily News Report. Alcoa and Larsen and Toubro Ltd. Apr. 27, 1994.

¹⁰Reynolds Metals Co., News Release. Reynolds Metals Signs Technology Agreements in India. Nov. 21, 1994.

¹¹Journal of Commerce. Alumina Plant Slated for Eastern India. V. 400, No. 28,244, June 10, 1994, p. 4B.

¹²American Metal Market. India's Nalco Cuts Alumina Output 10%. V. 102, No. 203, Oct. 20, 1994, p. 20.

¹³Mining Journal. Kaiser Announces Jamaican Cutbacks. V. 322, No. 8260, Jan. 28, 1994, p. 63.

¹⁴Metal Bulletin. Jamaica Moves Ahead with Alumina Project. No. 7929, Nov. 10, 1994, p. 5.

¹⁵Financial Times. Alumina Terminal Opened on Russia's East Coast. May 6, 1994, p. 32.

¹⁶Metal Bulletin Monthly. Metals Exports Fund Russian Alumina Handling Project. V. 280, Apr. 1994, p. 24.

¹⁷Platt's Metals Week. Saudis Seek Investment for Bauxite Production. V. 65, No. 19, May 9, 1994, p. 10.

¹⁸———. In Billion Dollar Deal Gencor Buys Billiton Metals Operations. V. 65, No. 31, Aug. 1, 1994, p. 1.

OTHER SOURCES OF INFORMATION

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Aluminum. Mineral Industry Surveys, monthly.

Bauxite and Alumina. Mineral Industry Surveys, quarterly.

Alumina Plants Worldwide, biennial.

Bauxite Mines Worldwide.

Primary Aluminum Plants Worldwide, biennial.

Other Sources

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CRU Alumina Monitor, bimonthly.

Industrial Minerals (London), monthly.

Metal Bulletin.

Platt's Metals Week.

Roskill Information Services Ltd. Bauxite & Alumina 1993, 2nd ed.

TABLE 1
SALIENT BAUXITE STATISTICS 1/

(Thousand metric tons and thousand dollars)

	1990	1991	1992	1993	1994
United States:					
Production: Crude ore (dry equivalent)	W	W	W	W	W
Value	W	W	W	W	W
Exports (as shipped)	74	51	63	90	129
Imports for consumption 2/	12,100	11,900	10,900	11,600	10,700
Consumption (dry equivalent)	12,000	12,200	11,900	11,900	11,700
World: Production	113,000 r/	111,000 r/	105,000 r/	108,000 r/	107,000 e/

e/ Estimated. r/ Revised. W Withheld to avoid disclosing company proprietary data.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits.

2/ Excludes calcined bauxite. Includes bauxite imported to the U.S. Virgin Islands.

TABLE 2
 PRODUCTION AND SHIPMENTS OF ALUMINA IN THE UNITED STATES 1/

(Thousand metric tons)

Year	Calcined alumina	Other alumina 2/	Total	
			As produced or shipped 3/	Calcined equivalent
Production: e/				
1993	4,840	655	5,490	5,290
1994	4,360	730	5,090	4,860
Shipments: e/				
1993	4,780	660	5,440	5,230
1994	4,380	700	5,080	4,850

e/ Estimated.

1/ Data rounded by the U. S. Bureau of Mines to three significant digits.

2/ Trihydrate, activated, tabular, and other aluminas. Excludes calcium and sodium aluminates.

3/ Includes only the end product if one type of alumina was produced and used to make another type of alumina.

TABLE 3
CAPACITIES OF DOMESTIC ALUMINA PLANTS, 1/ 2/ DECEMBER 31

(Thousand metric tons per year)

Company and plant	1993	1994
Aluminum Co. of America: Point Comfort, TX	1,740	1,740
Kaiser Aluminum & Chemical Corp.: Gramercy, LA	1,000	1,000
Ormet Corp.: Burnside, LA	600	600
Reynolds Metals Co.: Corpus Christi, TX	1,700	1,600
Virgin Islands Alumina: St. Croix, VI	635	635
Total	5,670	5,570

1/ Capacity may vary depending on the bauxite used.

2/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

TABLE 4
U.S. CONSUMPTION OF BAUXITE, BY INDUSTRY 1/

(Thousand metric tons, dry equivalent)

Industry	1993	1994
Alumina	11,000	10,900
Abrasive 2/	203	197
Chemical	225	192
Refractory	429	384
Other	58	52
Total	11,900	11,700

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Includes consumption by Canadian abrasive industry.

TABLE 5
 PRODUCTION AND SHIPMENTS OF SELECTED ALUMINUM
 SALTS IN THE UNITED STATES IN 1993 1/

Item	Number of producing plants	Production (thousand metric tons)	Total shipments, including interplant transfers	
			Quantity (thousand metric tons)	Value (thousands)
Aluminum sulfate:				
Commercial and municipal (17% Al ₂ O ₃)	69	952	934	\$102,000
Iron-free (17% Al ₂ O ₃)	22	157	158	21,000
Aluminum chloride:				
Liquid and crystal	6	19	5	W
Anhydrous (100% AlCl ₃)	4	18	18	11,700
Aluminum fluoride, technical	3	W	W	W
Aluminum hydroxide, trihydrate [100% Al(OH) ₃]	10	829	829	171,000
Aluminates	17	116	114	24,900
Other aluminum compounds 2/	XX	XX	XX	190,000

W Withheld to avoid disclosing company proprietary data. XX Not applicable.

1/ Data rounded by the U.S. Bureau of Mines to three significant digits.

2/ Includes light aluminum hydroxide, cryolite, etc.

Source: Data are based on Bureau of the Census 1993 Current Industrial Reports, Series MA-28A, "Inorganic Chemicals."

TABLE 6
STOCKS OF BAUXITE IN THE UNITED STATES, 1/ 2/ DECEMBER 31

(Thousand metric tons, dry equivalent)

Sector	1993	1994
Producers, processors, and consumers	1,590 r/	1,580
Government	16,900	17,600
Total	18,500 r/	19,200

r/ Revised.

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Domestic and foreign bauxite; crude, dried, calcined, activated, all grades.

TABLE 7
STOCKS OF ALUMINA IN THE UNITED STATES, 1/ 2/ DECEMBER 31

(Thousand metric tons, calcined equivalent)

Sector	1993	1994
Producers	521 r/	478
Primary aluminum plants	1,210	1,100
Total	1,730 r/	1,570

r/ Revised.

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Excludes consumers stocks other than those at primary aluminum plants.

TABLE 8
 AVERAGE VALUE OF U.S. IMPORTS OF CRUDE AND DRIED BAUXITE 1/

(Per metric ton)

Country	1993		1994	
	Port of shipment (f.a.s.)	Delivered to U.S. ports (c.i.f.)	Port of shipment (f.a.s.)	Delivered to U.S. ports (c.i.f.)
Australia	\$12.41	\$20.81	\$10.00	\$20.25
Brazil	28.67	36.18	27.68	35.62
Guinea	25.43	32.68	23.53	30.83
Guyana	32.06	42.00	27.29	38.35
Jamaica	28.95	34.46	25.08	30.11
Weighted average	27.84	34.84	25.10	32.13

1/ Computed from quantity and value data reported to U.S. Customs Service and compiled by the Bureau of the Census, U. S. Department of Commerce. Not adjusted for moisture content of bauxite or differences in methods used by importers to determine value of individual shipments.

TABLE 9
U.S. EXPORTS OF ALUMINA, 1/ 2/ BY COUNTRY

(Thousand metric tons, calcined equivalent, and thousand dollars)

Country	1993		1994	
	Quantity	Value	Quantity	Value
Brazil	247	39,200	234	47,500
Canada	814	170,000	726	139,000
Finland	25	4,050	(3/)	447
Mexico	38	21,300	33	18,500
Netherlands	20	5,500	14	9,150
Norway	20	3,370	--	--
Sweden	14	2,350	(3/)	133
Other	62 r/	60,300 r/	35	56,900
Total	1,240	306,000	1,040	271,000

r/ Revised.

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Includes exports of aluminum hydroxide (calcined equivalent) as follows: 1993 -- 34,400 tons and 1994 -- 44,200 tons.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 10
U.S. IMPORTS FOR CONSUMPTION OF BAUXITE, CRUDE AND DRIED, 1/ 2/ BY COUNTRY

(Thousand metric tons)

Country	1993	1994
Australia	148	54
Brazil	1,860	1,630
China	120	61
Guinea	3,780	3,740
Guyana	1,290	1,150
Indonesia	387	390
Jamaica 3/	3,920	3,650
Malaysia	11	--
Other	104	67
Total	11,600	10,700

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Includes bauxite imported to the U.S. Virgin Islands from foreign countries.

3/ Dry equivalent of shipments to the United States.

NOTE.--Total U.S. imports of crude and dried bauxite (including the U.S. Virgin Islands) as reported by the Bureau of the Census were as follows: 1993 -- 11,600,000 tons and 1994 -- 9,870,000 tons.

Source: Bureau of the Census and the Jamaica Bauxite Institute.

TABLE 11
U. S. IMPORTS FOR CONSUMPTION OF CALCINED BAUXITE, BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

Country	1993				1994			
	Refractory grade		Other grade		Refractory grade		Other grade	
	Quantity	Value 2/	Quantity	Value 2/	Quantity	Value 2/	Quantity	Value 2/
Australia	--	--	12	985	--	--	7	553
Brazil	16	1,120	--	--	2	181	24	1,890
China	66	3,600	86	4,280	153	6,540	137	6,820
Guyana	53	6,750	--	--	25	3,110	--	--
Other	--	--	4	264	--	--	--	--
Total	135	11,500	102	5,530	181	9,830	168	9,260

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Value at foreign port of shipment as reported to U. S. Customs Service.

Source: Bureau of the Census; data adjusted by the U. S. Bureau of Mines.

TABLE 12
U. S. IMPORTS FOR CONSUMPTION OF ALUMINA, BY COUNTRY 1/

(Thousand metric tons, calcined equivalent, and thousand dollars)

Country	1993		1994	
	Quantity	Value 2/	Quantity	Value 2/
Australia	2,720	443,000	2,080	328,000
Brazil	33	9,740	11	6,020
Canada	84	46,400	84	50,600
France	10	17,500	11	14,600
Germany	22	37,800	34	54,600
Guinea	28	4,750	--	--
India	116	18,900	102	17,600
Israel	(3/)	6	--	--
Italy	(3/)	596	(3/)	407
Jamaica	379	62,800	320	50,000
Japan	8	16,100	8	16,600
Suriname	313	49,000	187	26,000
Venezuela	85	17,200	126	27,100
Other	141	30,300	160	31,100
Total	3,940	754,000	3,120	623,000

1/ Previously published and 1994 data are rounded by the U. S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Value at foreign port of shipment as reported to U. S. Customs Service.

3/ Less than 1/2 unit.

Source: Bureau of the Census; data adjusted by the U. S. Bureau of Mines.

TABLE 13
BAUXITE: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1990	1991	1992	1993	1994 e/
Albania e/	26	20	4	2	2
Australia	41,400	40,500	39,700	41,300 r/	41,700 3/
Bosnia and Herzegovina	XX	XX	200	100 e/	75
Brazil	9,680	10,400	9,370	9,410 r/	8,120
China e/	2,400	2,600	2,700	3,500 r/	3,700
Croatia	XX	XX	7	2	10
Dominican Republic 4/	85	7	--	--	--
France	490	9	--	--	--
Ghana	381	353 e/	338	424	426 3/
Greece	2,500	2,130	2,040	1,700 e/	1,600
Guinea 4/	15,800	15,500	13,800 e/	14,100 e/	14,400
Guyana 4/	1,420	2,200	2,380	2,130 e/	2,100
Hungary	2,560	2,040	1,720	1,560 r/	900
India	4,850	4,740	4,900	5,220	5,400
Indonesia	1,210	1,410	804	1,320	1,300
Iran e/	100	100	100	100	100
Italy	(5/)	9 e/	98	90 r/	90
Jamaica 4/ 6/	10,900	11,600	11,300 e/	11,400 r/	11,700 3/
Kazakhstan	XX	XX	3,040 r/	3,000 r/	2,430 3/
Malaysia	398	376	331 e/	69	162 3/
Mozambique	7	8	8	6 e/	10 3/
Pakistan	3	4	3	5	5
Romania	243	200	175	186 r/	184
Russia	XX	XX	4,580 r/	4,260 r/	3,000
Serbia and Montenegro	XX	XX	792	102 r/	--
Sierra Leone	1,430	1,290	1,250 e/	1,170	735 3/
Spain	1	1 e/	--	--	--
Suriname	3,280	3,200	3,250 e/	3,400 e/	3,440
Turkey 7/	773	489	613 r/	538 r/	500
U.S.S.R. 8/	9,250 r/	7,870 r/	XX	XX	XX
United States	W	W	W	W	W
Venezuela	771	1,990	1,050 e/	2,910 e/	4,790 3/
Yugoslavia 9/	2,950	1,910	XX	XX	XX
Total	113,000 r/	111,000 r/	105,000 r/	108,000 r/	107,000

e/ Estimated. r/ Revised. W Withheld to avoid disclosing company proprietary data; not included in "Total." XX Not applicable.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data available through July 26, 1995.

3/ Reported figure.

4/ Dry bauxite equivalent of crude ore.

5/ Less than 1/2 unit.

6/ Bauxite processed for conversion to alumina in Jamaica plus kiln-dried ore prepared for export.

7/ Public-sector production only.

8/ Dissolved in Dec. 1991. In addition to the bauxite reported in the body of the table, Russia produces nepheline syenite concentrates and Azerbaijan produces alunite ore as sources of aluminum. Estimated nepheline syenite concentrate, produced in Russia was as follows, in thousand metric tons: 1990--1,650; 1991--1,500; 1992--1,500; 1993--1,390 (reported) and 1994--1,300. Estimated alunite ore produced in Azerbaijan was as follows, in thousand metric tons: 1990--550; 1991--500; 1992--300; 1993--200; and 1994--150. Nepheline syenite concentrate grades 25% to 30% alumina, and alunite ore grades 16% to 18% alumina; these commodities may be converted to their bauxite equivalent by using factors of 1 ton of nepheline syenite concentrate equals 0.55 ton of bauxite and 1 ton of alunite equals 0.34 ton of bauxite.

9/ Dissolved in Apr. 1992.

TABLE 14
ALUMINA: WORLD PRODUCTION, 1/ BY COUNTRY 2/ 3/

(Thousand metric tons)

Country	1990	1991	1992	1993	1994 e/
Australia	11,200	11,700	11,800	12,600	12,900 4/
Azerbaijan	XX	XX	300	200 e/	150
Bosnia and Herzegovina	XX	XX	100 e/	50 e/	50
Brazil	1,660	1,740	1,830	1,830	1,870
Canada	1,090	1,130	1,100	1,180 r/	1,170
China e/	1,460	1,520	1,580	1,820 r/	1,900
Czechoslovakia e/ 5/ 6/	175	187 r/	143 r/	XX	XX
France	606	538	508	476 r/	438 4/
Germany:					
Eastern states	50 r/	XX	XX	XX	XX
Western states	922	XX	XX	XX	XX
Total	972 r/	863	857	840 r/	850
Greece	587	625	612	510 e/	475
Guinea	631	610	561	600 e/	600
Hungary	826	635	548	450 e/	175
India e/	1,600 4/	1,700	1,700	1,800	2,000
Ireland	885 e/	981	973 r/	1,100 r/ e/	1,000
Italy 7/	752	805	762	840 r/ e/	825
Jamaica	2,870	3,020	2,920	2,990	3,220 4/
Japan 8/	481	438	316	327	300
Kazakhstan e/	XX	XX	1,100	1,000	700
Romania	440	413	280	293 e/	302 4/
Russia e/	XX	XX	3,100	3,500	2,600
Serbia and Montenegro e/	XX	XX	197	12 r/	15
Slovakia e/ 6/	XX	XX	XX	140	140
Slovenia e/	XX	XX	45	40	40
Spain 7/	1,000	1,000 e/	959	1,060 r/ e/	1,000
Suriname	1,530	1,510	1,580	1,500 e/	1,500
Turkey	177	159	156	142 r/	145
Ukraine e/	XX	XX	1,100 r/	1,010 r/	1,070
U.S.S.R. e/ 9/	5,900	5,280 3/	XX	XX	XX
United Kingdom e/	115	110	120 r/	105 r/	105
United States	5,230	5,230	5,190	5,290	4,860 4/
Venezuela	1,290	1,300	1,310	1,500 e/	1,650
Yugoslavia 10/	1,090	900 e/	XX	XX	XX
Total	42,600 r/	42,400	41,700 r/	43,200 r/	42,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Figures represent calcined alumina or the total of calcined alumina plus the calcined equivalent of hydrate when available; exceptions, if known, are noted.

2/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

3/ Table includes data available through June 26, 1995.

4/ Reported figure.

5/ Dissolved Dec. 31, 1992.

6/ All production in Czechoslovakia from 1990-92 came from Slovakia.

7/ Hydrate.

8/ Data presented are for alumina used principally for specialty applications. Gross weight of aluminum hydrate for all uses was as follows, in thousand metric tons: 1990--890; 1991--864; 1992--714; 1993--704; 1994--not available.

9/ Dissolved in Dec. 1991.

10/ Dissolved in Apr. 1992.