

# ALUMINUM

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Domestic primary aluminum production increased slightly in 1996 to 3.6 million metric tons. Thirteen companies operated 22 primary aluminum reduction plants, and 1 plant remained closed. Montana, Oregon, and Washington accounted for 38% of the production; Kentucky, North Carolina, South Carolina, and Tennessee, 21%; and other States, 41%. The value was estimated to be \$5.6 billion.

Aluminum recovered from purchased scrap increased to about 3.3 million tons. Of this recovered metal, 52% came from new (manufacturing) scrap and 48% from old (discarded aluminum products) scrap. Aluminum used beverage can (UBC) scrap accounted for about one-half of the reported old scrap consumption in 1996. The recycling rate for aluminum UBC's increased slightly to 63.5%.

Transportation and the container and packaging industries remained the largest domestic markets for aluminum products in 1996. The transportation industry accounted for an estimated 32% of domestic consumption; containers and packaging, 26%; building and construction, 16%; electrical and consumer durables, 8% each; and other uses, 10%.

U.S. imports for consumption of aluminum materials decreased in 1996 compared with those of the previous year. Although imports from Russia continued to decline from their peak level in 1994, Russia remained the second largest shipper, following Canada, of aluminum materials to the United States. Total exports from the United States also decreased in 1996.

The price of primary aluminum ingot on the domestic and the international markets fluctuated during the year but trended downward before recovering near the end of the year. The annual average price of primary ingot was substantially lower than that in 1995. Prices in the aluminum scrap markets paralleled the general trend of primary ingot prices during the year.

World inventory levels at the end of 1996 were mixed. Inventories held by the London Metal Exchange (LME) increased by about 400,000 tons. World producer stocks, however, decreased by a similar amount, as reported by the International Primary Aluminium Institute (IPAI). U.S. inventories also decreased slightly during the year.

Primary aluminum was produced in 44 countries in 1996. The United States was the largest producer with 17% of the world total, followed by Russia with 14% and Canada with 11%. World metal production increased slightly compared with that of 1995.

## Legislation and Government Programs

The 1997 Defense Authorization Act authorized the Defense

Logistics Agency to sell the entire inventory of aluminum metal from the National Defense Stockpile (NDS) in fiscal year 1997, beginning October 1996. There were no sale offers in calendar year 1996, and the NDS inventory at the end of the year remained at about 57,000 tons.

## Production

**Primary.**—Domestic primary aluminum production, totaling 3,577,222 tons, increased by 6% compared with that in 1995. (See tables 1 and 2.) Production data were obtained from the 13 domestic producers, all of whom responded to the U.S. Geological Survey's (USGS) request for data.

Workers at 10 primary aluminum smelters ratified new labor agreements during the year. The Aluminum Co. of America (Alcoa), Reynolds Metals Co., the United Steelworkers of America (USW), and the Aluminum, Brick, and Glass Workers International Union (ABG) announced the signing of a new 6-year contract covering 16,500 workers at 30 locations, including 9 smelters, in 18 States. The contract reportedly includes wage increases totaling \$1.15 per hour during the first 5 years and improved pension benefits (Platt's Metals Week, 1996i). The USW and Ormet Corp. reported the ratification of a new 3-year contract covering workers at Ormet's Hannibal, OH, primary aluminum smelter. The agreement reportedly provided for an 85-cent-per-hour increase in direct wages during the next 3 years plus increases in the profit-sharing program (Regan, 1996d).

The ABG agreed to merge with the USW. The merger was scheduled to become effective on January 20, 1997. The addition of the 40,000 ABG members reportedly will increase the USW membership to about 740,000 workers (Robertson, 1996).

Southwire Co. announced plans to add a 50,000-ton-per-year (t/yr) potline at its NSA smelter in Hawesville, KY. A company spokesman reported that two criteria must be met before a final decision is made on the proposed expansion—securing the necessary environmental permits and negotiating a long-term power-supply agreement (Platt's Metals Week, 1996h).

Alumax Inc. announced the sale of a 23% interest in the 205,000-t/yr Mount Holly, SC, primary aluminum smelter to Glencore Primary Aluminum Co. Following the sale, Alumax retained a 50.33% interest in the plant, and Glencore International AG's interest rose to 49.67% through its subsidiaries Glencore Primary Aluminum (23%) and Century Aluminum Co. (26.67%) (Alumax Inc., 1996c).

Brett Wilcox, president and owner of Northwest Aluminum Corp., acquired 60% of Goldendale Aluminum Co. Goldendale

previously had acquired Columbia Aluminum Co.'s 168,000-t/yr primary aluminum smelter in Goldendale, WA, and its alumina unloading facility in Portland, OR. Goldendale's Employee Stock Ownership Plan retained 40% of the company's preferred stock. Ken Peterson, former CEO of Columbia Aluminum, retained 100% ownership of Columbia's extrusion, recycling, metal trading, and diversified businesses and will operate these facilities under the name "Columbia Ventures Corp." (Platt's Metals Week, 1996b). Hydro Aluminum Louisville Inc., a subsidiary of Norsk Hydro A/S, reported the signing of a 10-year toll-conversion contract with Goldendale for 100% of the smelter's output to become effective on January 1, 1997 (Platt's Metals Week, 1996f).

Ormet reached an agreement with American Electric Power Co. (AEP) on an interim power-supply arrangement from 1997 through 1999 for Ormet's aluminum smelter and rolling mill in Hannibal, OH; the previous 30-yr power-supply contract will expire in 1997. Ormet reported that it would continue to search for a power supplier to meet its long-term energy requirements (Regan, 1996b).

Intalco Aluminum Corp., a subsidiary of Alumax, announced that it has agreed to annual purchases of 770 gigawatt hours (GWh) of electricity and up to 145 megawatts (MW) from Powerex, the export division of BC Hydro of Vancouver, WA. The 5-year agreement will continue through September 30, 2000. In a separate agreement, Bonneville Power Administration will continue to supply the majority of the Ferndale, WA, smelter's full production capacity power load of 460 MW/yr (Platt's Metals Week, 1996g).

Alumax announced the sale of several of its fabricated products businesses in Western Europe and the United States to Euramax International, Ltd. The sale included 5 companies in Europe and more than 30 plants and service centers in the United States. Euramax is a new company incorporated under the laws of England and Wales by CVC European Equity Partners, L.P. and several Citicorp entities (Alumax Inc., 1996d). To handle the U.S. operations, Euramax announced the formation of Amerimax Fabricated Products Inc. (Regan, 1996a).

Universal Alloy Corp. announced its first expansion outside the West Coast with the construction of a new facility in Canton, GA, that will increase by one-third the company's capacity to produce aluminum extrusions for the aircraft industry. The new plant was expected to give Universal Alloy a presence on the East Coast and access to the European market that will compliment its existing West Coast location, which also serves the Pacific Rim. The plant is scheduled to begin operations in January 1998 (Haflich, 1996).

Kaiser Aluminum & Chemical Corp. broke ground for its first commercial Micromill facility, near Reno, NV. The Micromill process is a proprietary, compact, high-speed process for the continuous casting and rolling of thin-strip aluminum sheet. The company expects the Nevada facility to begin startup in the first half of 1997 and anticipates beginning limited customer shipments of can sheet from the facility by the second half of 1997 (Kaiser Aluminum & Chemical Corp., 1997).

Kaiser also announced plans to expand the heat-treat capacity at its Trentwood, WA, rolling mill to about 60,000 t/yr from its current capacity of 45,000 t/yr. The expansion will enable the company to increase the range of its heat-treat products, including wide heat-treated sheet for the aerospace industry. The \$45-million project is scheduled to be completed in about 2 years (Kaiser Aluminum & Chemical Corp., 1997).

In late April, Alcoa commissioned the largest vertical heat-treat furnace in North America at its Davenport, IA, plant that tripled the plant's capacity for wide-width fuselage sheet. Construction also began on a horizontal plate heat-treating furnace that will increase plate capacity by 50%. Alcoa expects this capacity, part of a \$75-million investment to meet aerospace and automotive demand, to be operational in early 1997 (Aluminum Company of America, 1997).

Two of the Nation's major independent aluminum rolling mills, Commonwealth Aluminum Corp. and CasTech Aluminum Group Inc., agreed to a merger that would combine the companies' capabilities of continuous casting and conventional rolling technologies. The combined company reportedly will have the capacity to produce more than 400,000 t/yr of aluminum sheet plus about 145,000 kilometers per year of aluminum electrical products (Regan, 1996c).

Alumax Extrusions Inc., a subsidiary of Alumax Inc. and one of the largest extruders of custom, soft-alloy aluminum shapes in the United States with annual shipments of about 135,000 tons, announced the acquisition of Cressona Aluminum Co. Cressona manufactures and ships about 160,000 t/yr of standard and custom extruded shapes, extruded rod and bar products, and structural and seamless pipe and tube. Alumax Extrusions and Cressona have a combined total of 40 extrusion presses ranging in size from 750 to 6,000 tons (Alumax Inc., 1996b).

**Secondary.**—Metal recovered from new and old scrap reached a historic high of about 3.3 million tons in 1996, according to data derived by the USGS from its "Aluminum Scrap" survey. (See tables 3, 4, and 5.) Of the 90 companies and (or) plants to which monthly or annual survey requests were sent, 71 responded, representing 82% of the total scrap consumed shown in table 4.

According to figures released by the Aluminum Association Inc., the Can Manufacturers Institute, and the Institute of Scrap Recycling Industries Inc., 62.8 billion aluminum beverage cans were recycled in the United States during 1996. The recycling rate, based on the number of cans shipped during the year, was 63.5%, a slight increase from the 62.2% recycling rate reported in 1995. According to the organizations' joint press release, aluminum beverage cans produced domestically in 1996 had an average 51.6% postconsumer recycled content, the highest content percentage of all packaging materials.

David J. Joseph Co. and George Koch Sons Inc. announced the formation of a joint venture to construct a new recycling plant in Henderson, KY. The venture, Audubon Metals, will process automobile shredder residue (ASR) and produce aluminum alloy for diecasting. Shredder residue will be supplied by Joseph, which owns and operates eight fragmentizers throughout the United States. Audubon will

separate aluminum from the ASR and smelt and alloy the scrap aluminum into secondary aluminum ingot (American Metal Market, 1996b).

Minerva Aluminum Co. Inc. announced the startup of a third specialty scrap melting furnace at its Minerva, OH, tolling facility. The plant uses a proprietary process for melting scrap aluminum castings contaminated with iron that is designed to prevent the molten aluminum from absorbing the iron during melting. According to the company president, the process also prevents the loss of magnesium and strontium, which are usually casualties in conventional melting furnaces (American Metal Market, 1996c).

Imco Recycling Inc. and Zemex Corp. announced their intention to set up a joint-venture project for the processing of aluminum dross and salt cake. The agreement reportedly calls for technology to be provided by Alumitech Inc., a wholly owned subsidiary of Zemex, and for feedstock to be supplied by Imco. Alumitech technology treats chloride-based drosses, the so-called black drosses, and salt cake materials from waste products generated in recycling aluminum scrap. According to the Zemex president, the Alumitech process not only separates the aluminum and commercial oxides but also can recycle the remaining materials into commercially salable products, hence completely avoiding landfilling (American Metal Market, 1996a).

### Consumption

The transportation industry, accounting for about 28% of total U.S. shipments of aluminum products, remained the largest domestic consumer of aluminum. (See tables 6 and 7.) Automotive uses in passenger cars and light trucks dominate this end-use market.

The use of aluminum by the automotive industry continued to grow. The "Big Three" automakers have announced new automotive designs that will expand the use of aluminum materials. Some of the new aluminum-intensive vehicles are General Motors Corp.'s new electric vehicle, the EV1; Chrysler Corp.'s concept cars, the Intrepid ESX (Dodge) and the Prowler (Plymouth); and Ford Motor Co.'s concept car, the Indigo.

Alcoa, Reynolds, and Kaiser announced plans to expand their production of aluminum wheels. Alcoa began construction of a \$20-million wheel production facility at its Cleveland plant. This is the first phase of a multiphase plan to increase production of forged aluminum wheels to meet market demand for U.S. light trucks. Alcoa and Superior Industries International Inc. formed a company to produce cast aluminum wheels for commercial trucks and buses at Superior's Van Nuys, CA, facility. Commercial production levels were expected to be reached by mid-1997 (Aluminum Company of America, 1997). Reynolds began construction of a facility in Lebanon, VA, to manufacture aluminum wheels by using a process that combines Reynolds' computer-controlled, flow-formed casting technology with forging to produce lightweight wheels that have added styling flexibility (Reynolds Metals Co., 1997). Kaiser announced that it had signed a letter of intent

with Accuride Corp. to form a joint venture to design, manufacture, and market aluminum wheels for the commercial truck and trailer industry (Kaiser Aluminum & Chemical Corp., 1997).

Reynolds reported that it had started a \$5-million casting complex at its McCook, IL, sheet and plate facilities that doubled the company's aluminum-lithium capacity. The company is the main supplier of AA2195 aluminum-lithium plate and extrusion products for use on the space shuttle's new external fuel tank. The AA2195 alloy reportedly is 30% stronger and weighs 5% less than the alloy it is replacing and is expected to play a major role in a 3,400-kilogram reduction in the weight of the current external tank (Metal Bulletin, 1996g).

### Stocks

Inventories of aluminum ingot, mill products, and scrap at reduction and other processing plants, as reported by the U.S. Department of Commerce, decreased from 2.0 million tons at yearend 1995 to 1.83 million tons at yearend 1996.

The LME reported that its U.S. warehouses held about 12,400 tons of primary aluminum metal ingot at yearend 1996, a slight decrease from the approximately 13,800 tons of metal held in these warehouses at yearend 1995. The LME also reported that aluminum alloy ingot at its U.S. warehouses at yearend 1996 totaled 20,100 tons, a significant decrease from the 30,900 tons of alloy held at yearend 1995.

Because there were no releases of metal from the NDS during the year, the inventory level remained at 57,000 tons.

### Prices

The monthly average U.S. market price of primary aluminum metal, as reported by Platt's Metals Week, fluctuated during the year but followed a general downward trend before recovering near the end of the year. The monthly average price began the year at 75.2 cents per pound and posted a low of 64.4 cents per pound in October. By December, the monthly average had recovered to 72.2 cents per pound. The average price for the year was 71.35 cents per pound, a substantial decrease compared with the 1995 average annual price of 85.88 cents per pound.

The LME cash price for high-grade primary aluminum ingot followed the same general trend as the U.S. market price. The 1996 average annual LME cash price was 68.3 cents per pound.

Purchase prices for aluminum scrap, as quoted by American Metal Market (AMM), followed the trend of primary ingot prices and closed the year at slightly lower levels than those at the beginning of the year. The yearend price ranges for selected types of aluminum scrap were as follows: mixed low-copper-content aluminum clips, 52 to 52.5 cents per pound; old sheet and cast, 47 to 49 cents per pound; and clean, dry aluminum turnings, 48 to 48.5 cents per pound.

Aluminum producers' buying price range for processed and delivered UBC's, as quoted by AMM, fluctuated during the year from a high of 58 to 60 cents per pound at the beginning of the

year and during the months of April and May to a low of 47 to 48 cents per pound during June and July. At the end of the year, the price ranged from 53 to 54 cents per pound. Resource Recycling published a monthly transaction price for aluminum UBC's in its Container Recycling Report. The average annual UBC transaction price for 1996 was 54.7 cents per pound, a substantial decrease from the 1995 annual average of 66.7 cents per pound.

The yearend indicator prices, as published in AMM, for selected secondary aluminum ingots also decreased compared with those of 1995 and were as follows: alloy 380 (1% zinc content), 79.37 cents per pound; alloy 360 (0.6% copper content), 84.44 cents per pound; alloy 413 (0.6% copper content), 84.66 cents per pound; and alloy 319, 81.50 cents per pound. Platt's Metals Week published an annual average U.S. price of 67.3 cents per pound for A-380 alloy (3% zinc content). The average annual LME cash price for a similar 380 alloy was 59 cents per pound.

### Foreign Trade

Total exports of aluminum from the United States decreased in 1996, reversing an upward trend that began in 1994. Although exports of crude metal and alloys increased, semifabricated materials and scrap exports decreased compared with those of 1995. Canada, Japan, and Mexico, in decreasing order of shipments, accounted for about two-thirds of total U.S. exports. (See tables 8 and 9.)

Imports for consumption continued to decrease in 1996. Although imports decreased in all categories, as shown in table 11, the largest decrease was in semifabricated materials. Canada remained the major source country, supplying about two-thirds of total imports. Russia remained the second largest supplier of aluminum materials; total imports from Russia, however, continued to decline following the rapid growth of shipments between 1991 and 1994. (See tables 10 and 11.)

### World Review

World production of primary aluminum metal increased slightly in 1996. (See table 12.) Total world inventories of aluminum were relatively unchanged — an increase in LME inventories was balanced by a decline in producer inventories. World metal prices fluctuated during the year and finished the year lower than yearend 1995 prices.

Unwrought primary aluminum inventories held by members of IPAI decreased from 2.0 million tons at yearend 1995 to 1.69 million tons at yearend 1996. IPAI total metal inventories, including secondary aluminum, decreased from 3.57 million tons at yearend 1995 to 3.14 million tons at yearend 1996.

Inventories of primary aluminum metal held by the LME increased during most of 1996 before turning slightly downward during the last 2 months of the year. By the end of the year, inventories had increased to 951,000 tons from 584,000 tons at the end of 1995.

**Argentina.**—Aluminio Argentino SAIC (Aluar) announced

a formal decision to proceed with a planned \$300-million expansion at its 185,000-t/yr Puerto Madryn primary aluminum smelter. The expansion, scheduled for completion in mid-1999, will use Pechiney technology that could increase the smelter's capacity by 72,000 t/yr (Metal Bulletin, 1996a).

**Austria.**—Oesterreichische Industrieholding AG, the government holding company, reportedly has agreed to sell Austria Metall AG to a consortium led by Klaus Hammerer (40%), chairman of Austria Metall; Constantia (40%), a private Austrian concern; and the employees of Austria Metall (20%). Austria Metall holds interests in primary aluminum smelters in Canada and Germany (CRU, 1996).

**Brazil.**—According to the Brazilian aluminum association, Associacao Brasileira do Alumínio (Abal), aluminum can production capacity in Brazil should increase to 11.6 billion cans per year from the current annual capacity of 4.2 billion cans. Expansions are underway at Reynold's Latasa subsidiary, which has been producing aluminum cans in Brazil since 1990. In addition, new canmaking facilities are planned by Crown Cork Embalagens, a joint venture of Crown Cork and Grupo Petropar; American National Can, a Pechiney subsidiary; and Latapak Ball, a subsidiary of Ball Corp. and Grupo Mariani (Metal Bulletin, 1996b).

**Canada.**—Alcan Aluminium Ltd. and Canadian Auto Workers Local 2301 announced the ratification of a new 3-year labor agreement covering 1,300 workers at Alcan's Kitimat primary aluminum smelter in British Columbia. The agreement reportedly contains a 3% wage increase in each of the 3 years of the contract, a \$2,500-lump-sum payment in the first year, and a cost of living allowance in the second and third years (Alcan Aluminium Ltd., 1996).

Alcan established a project team to evaluate the construction of a new 350,000-t/yr smelter in Alma, Quebec. Environmental impact studies have begun, and an agreement-in-principle was reached with Hydro-Quebec that ensures that the smelter will have access to sufficient power at a competitive cost. A final decision on this project is not expected to be made until late 1997 or early 1998 (Alcan Aluminium Ltd., 1997).

**Chile.**—Noranda Aluminum Inc. is seeking partners for its proposed \$1.2-billion Alumysa smelter complex near the port of Aysen. Full plans call for a 270,000-t/yr primary aluminum smelter, two hydroelectric powerplants, and port facilities. Basic engineering on the venture reportedly has been completed, and an environmental impact study is underway. If a decision to proceed is made, then construction of the complex is expected to take about 4 years (Metal Bulletin, 1996f).

**China.**—In April, Alumax and Reynolds announced the formation of joint ventures to produce light-gauge aluminum foil for China's food, pharmaceutical, and tobacco industries. Alumax and Yunnan Aluminum Processing Factory in Kunming announced a \$70-million joint venture, Yunnan Xinmeilu Aluminum Foil Co. Ltd., for the production of 8,000 to 10,000 t/yr of foil. The venture will upgrade an existing common alloy sheet plant by using Alumax technology (Alumax Inc., 1996a). Reynolds acquired an interest in Bohai Aluminium Industries Ltd., which runs a fabricating facility east of Beijing that

produces aluminum foil and extrusions (Reynolds Metals Co., 1997).

**Egypt.**—The Aluminium Company of Egypt (Egyptalum) announced that the addition of a prebaked potline to its 180,000-t/yr Nag Hammadi primary aluminum smelter is scheduled to come on-line in 1997. The potline, containing 92 pots, will increase capacity at the plant by 55,000 t/yr (Metal Bulletin, 1996c).

**Hungary.**—Inota Aluminium Works, a subsidiary of Hungarian aluminum producer Hungalu Magyar Aluminiumipari, was recently privatized when Hungary's State Privatization and Property Management Corporation sold a majority of shares in the 34,000-t/yr Inota aluminum smelter to Magyar Aluminium Kft. Two smaller smelters, Ajka (22,000 t/yr) and Tatabanya (17,000 t/yr), were considered to be too uneconomic to privatize and were closed (Metal Bulletin, 1996d).

**Iceland.**—According to the Icelandic Energy Marketing Agency, an agreement with the U.S. aluminum producer, Columbia Venture Corp., was expected to be finalized for the construction of a 60,000-t/yr aluminum smelter. Columbia reportedly purchased the Tosing smelter in Germany and was planning to reconstruct it on a site in Iceland. Reconstruction could start early next year, and production could begin in mid-1998 (Mining Journal, 1996b).

**India.**—Hindalco Industries Ltd. announced plans to expand capacity from 190,000-t/yr to 242,000-t/yr at its Renukoot smelter during the next 2 years. Hindalco is also considering the possibility of building a 200,000-t/yr greenfield smelter in the State of Orissa (Rao, 1996).

**Italy.**—In March, Alcoa completed the acquisition of the principal operating assets of Alumix S.p.A., Italy's state-owned integrated aluminum producer. Aluminum smelters at Portovesme and Fusina, which have a combined annual capacity of 180,000 tons, were among the assets purchased (Aluminum Company of America, 1997).

**Kuwait.**—The Kuwaiti Ministry of Finance has approved plans by Raytheon Co. of the United States to build a 230,000-t/yr primary aluminum smelter. The project, worth about \$1 billion, reportedly would involve local and foreign partners. Although the finance ministry has approved the plans, other licenses will have to be obtained from other government departments before the plan can proceed (Mining Journal, 1996c).

**Mozambique.**—Gencor Ltd. received government approval for its proposed \$1.2-billion primary aluminum smelter project. The 245,000-t/yr smelter, Mozal, would be located in Maputo Province. A final decision on the project is expected next year, pending the participation of equity partners and the signing of a competitively priced electricity supply contract (Platt's Metals Week, 1996c).

**Norway.**—Norsk Hydro A/S announced the upgrade of its 220,000-t/yr Karmoy smelter. The upgrade involves the addition of 66 new cells, resulting in an increased capacity of 35,000 t/yr. The project was expected to be completed in about

18 months (Platt's Metals Week, 1996e).

**Oman.**—Oman may be set to join the ranks of aluminum producers if a proposal for a major new aluminum smelter is approved. The \$2.4-billion project is expected to be located near the port of Sohar and includes a 480,000-t/yr smelter and a natural-gas-fired powerplant (Mining Journal, 1996a).

**South Africa.**—Gencor Ltd. announced that it had reached an agreement with the state-owned Industrial Development Corp. to purchase its 32.15% stake in Alusaf Ltd. Alusaf operates two primary aluminum smelters at Richards Bay with a total capacity of 636,000 t/yr. The agreement increases Gencor's share in Alusaf to 73%. Gencor plans to make similar offers to minority shareholders and to take full control of Alusaf (Platt's Metals Week, 1996d).

**Turkey.**—Plans are being revived to expand capacity at the Seydisehir smelter in southern Turkey as part of the government's drive to strengthen the country's mineral sector. The \$225-million expansion will increase capacity from 60,000 t/yr to 100,000 t/yr and will replace the existing Soderberg equipment with prebake technology. Construction was expected to begin in 1997 and will take an estimated 30 months to complete (Mining Journal, 1996d).

**United Kingdom.**—British Alcan Aluminium plc, a subsidiary of Alcan Aluminium Ltd., completed the sale of 12 downstream businesses to a group of investors. The new entity will be known as British Aluminium Ltd. The investors include Mercury Development Capital, Morgan Grefell Development Capital, and CVC Capital Partners. British Alcan will continue to operate the UK's aluminum smelters (Platt's Metals Week, 1996a).

Later in the year, British Alcan announced a 2-yr investment plan to upgrade and refurbish potline No. 1 at its 130,000-t/yr Lynemouth smelter in Northumberland. The 70,000-t/yr potline has been closed since 1991 (Metal Bulletin, 1996e).

## Outlook

Barring any sudden economic shocks during the next few years, demand for and production of aluminum should continue to increase at a slow and steady pace. Capacity that was temporarily closed a few years ago is slowly coming back on-stream, and many producers are taking this opportunity to upgrade these closed potlines. Companies are once again looking at the possibility of expanding existing facilities or building new smelters. Many of these projects, however, are very early in the planning stages, which could lead to supply shortages in the not too distant future if there is a sudden increase in the demand for aluminum.

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- Aluminum. Mineral Industry Surveys, monthly.<sup>1</sup>
- Bauxite and Alumina. Mineral Industry Surveys, quarterly.<sup>1</sup>
- Aluminum and Bauxite. Ch. in United States mineral resources, U.S. Geological Survey Professional Paper 820.
- World bauxite resources, U.S. Geological Survey Professional Paper 1076-B.

### Other Sources

- Aluminum Statistical Review, Aluminum Association Inc., annual.
- Alumina Plants Worldwide, U.S. Bureau of Mines, 1993.
- Bauxite Mines Worldwide, U.S. Bureau of Mines, 1994.
- Primary Aluminum Plants Worldwide, U.S. Bureau of Mines, 1990.

<sup>1</sup>Prior to January 1996, published by the U.S. Bureau of Mines.

TABLE 1  
SALIENT ALUMINUM STATISTICS 1/

(Thousand metric tons unless otherwise specified)

	1992	1993	1994	1995	1996
United States:					
Primary production	4,042	3,695	3,299	3,375	3,577
Value (million dollars)	\$5,130	\$4,340	\$5,180	\$6,390	\$5,630
Price: (average cents per pound)					
U.S. market (spot)	57.5	53.3	71.2	85.9	71.3
Inventories (December 31)					
Aluminum industry 2/	1,880	1,980	2,070	2,000	1,830
LME stocks in U.S. warehouses	214	168	16	14	12
National Defense Stockpile	57	57	57	57	57
Secondary recovery 3/	2,760	2,940	3,090	3,190	3,290
New scrap	1,140	1,310	1,580	1,680	1,710
Old scrap	1,610	1,630	1,500	1,510	1,570
Exports (crude and semicrude)	1,450	1,210	1,370	1,610	1,500
Imports for consumption (crude and semicrude)	1,730	2,540	3,380	2,970	2,810
Aluminum industry shipments 4/	6,810	7,300	8,160	8,260 r/	8,260
Supply, apparent 5/	6,870	7,920	8,460	8,010	8,340
Consumption, apparent 6/	5,730	6,600	6,880	6,320	6,620
World: Production	19,500	19,800	19,200	19,900 r/	20,700 e/

e/ Estimated. r/ Revised.

1/ Data are rounded to three significant digits, except "prices" and "Primary production."

2/ Includes ingot, semifabricated material, and scrap. Data from Current Industrial Reports, Series M33-D, U.S. Department of Commerce, Bureau of the Census.

3/ Metallic recovery from purchased, tolled, or imported new and old scrap expanded for full industry coverage.

4/ Shipped to domestic industry.

5/ Defined as domestic primary metal production + secondary recovery + imports - exports + adjustments for Government and industry stock changes.

6/ Apparent supply less recovery from purchased new scrap.

TABLE 2  
PRIMARY ANNUAL ALUMINUM PRODUCTION CAPACITY IN THE UNITED STATES, BY COMPANY 1/

Company	Yearend capacity (thousand metric tons)		1996 ownership (percent)
	1995	1996	
<b>Alcan Aluminum Corp.:</b>			
Sebree, KY	186	186	Alcan Aluminum Ltd., 100%.
<b>Alumax Inc.:</b>			
Ferndale, WA (Intalco)	275	272	Alumax Inc., 61%; Mitsui & Co., 23%; TosTem Corp., 9%; YKK Corp., 7%.
Frederick, MD (Eastalco)	174	174	Do.
Mount Holly, SC	184	205	Alumax, 50.3%; Century Aluminum Co., 26.7%; Glencore Primary Aluminum Co., 23%.
Total	633	651	
<b>Aluminum Co. of America: 2/</b>			
Alcoa, TN	210	210	Aluminum Co. of America, 100%.
Badin, NC	115	115	Do.
Evansville, IN (Warrick)	300	300	Do.
Massena, NY	125	125	Do.
Rockdale, TX	315	315	Do.
Wenatchee, WA	220	220	Do.
Total	1,290	1,290	
<b>Columbia Falls Aluminum Co.:</b>			
Columbia Falls, MT	168	168	Montana Aluminum Investors Corp., 100%.
<b>Goldendale Aluminum Co.:</b>			
Goldendale, WA	168	168	Private interest, 60%; employees, 40%.
<b>Kaiser Aluminum &amp; Chemical Corp.:</b>			
Mead, WA (Spokane)	200	200	MAXXAM Inc., 100%.
Tacoma, WA	73	73	Do.
Total	273	273	
<b>NSA:</b>			
Hawesville, KY	188	186	Southwire Co., 100%.
<b>Noranda Aluminum Inc.:</b>			
New Madrid, MO	215	215	Noranda Mines Ltd., 100%.
<b>Northwest Aluminum Corp.:</b>			
The Dalles, OR	82	82	Private interests, 100%.
<b>Ormet Corp.:</b>			
Hannibal, OH	254	256	Ormet Corp., 100%.
<b>Ravenswood Aluminum Corp.:</b>			
Ravenswood, WV	168	168	Century Aluminum Co., 100%
<b>Reynolds Metals Co.:</b>			
Longview, WA	204	204	Reynolds Metals Co., 100%.
Massena, NY	123	123	Do.
Troutdale, OR	121	121	Do.
Total	448	448	
<b>Vanalco Inc.:</b>			
Vancouver, WA	116	116	Vanalco Inc., 100%.
Grand total	4,180	4,200	

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Individual plant capacities are U.S. Geological Survey estimates based on company reported total.



TABLE 3  
U.S. CONSUMPTION OF AND RECOVERY FROM PURCHASED NEW  
AND OLD ALUMINUM SCRAP 1/, BY CLASS 2/

(Metric tons)

Class	Consumption	Calculated recovery	
		Aluminum	Metallic
<b>1995:</b>			
Secondary smelters	1,300,000	978,000	1,050,000
Integrated aluminum companies	1,400,000	1,160,000	1,240,000
Independent mill fabricators	676,000	585,000	625,000
Foundries	102,000	84,000	90,300
Other consumers	10,800	9,570	9,600
<b>Total</b>	<b>3,480,000</b>	<b>2,820,000</b>	<b>3,010,000</b>
<b>Estimated full industry coverage</b>	<b>3,690,000</b>	<b>2,980,000</b>	<b>3,190,000</b>
<b>1996:</b>			
Secondary smelters	1,440,000	1,030,000	1,100,000
Integrated aluminum companies	1,410,000	1,170,000	1,250,000
Independent mill fabricators	709,000	613,000	655,000
Foundries	95,300	78,500	84,400
Other consumers	9,910	8,730	8,760
<b>Total</b>	<b>3,660,000</b>	<b>2,900,000</b>	<b>3,100,000</b>
<b>Estimated full industry coverage</b>	<b>3,880,000</b>	<b>3,070,000</b>	<b>3,290,000</b>

1/ Excludes recovery from other than aluminum-base scrap.

2/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 4  
U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM  
SCRAP 1/ AND SWEATED PIG IN 1996 2/

(Metric tons)

Class of consumer and type of scrap	Stocks, Jan. 1	Net receipts 3/	Consump- tion	Stocks, Dec. 31
<b>Secondary smelters:</b>				
New scrap:				
Solids	7,130 r/	138,000	138,000	7,760
Borings and turnings	4,170 r/	210,000	210,000	4,590
Dross and skimmings	3,730	326,000	326,000	3,670
Other 4/	2,560 r/	211,000	211,000	2,740
Total	17,600 r/	886,000	885,000	18,800
Old scrap:				
Castings, sheet, clippings	13,600 r/	419,000	411,000	21,100
Aluminum-copper radiators	898 r/	15,700	15,700	850
Aluminum cans 5/	560 r/	69,300	69,500	339
Other 6/	443	45,500	45,100	838
Total	15,500 r/	549,000	542,000	23,100
Sweated pig	2,500 r/	5,560	5,600	2,460
Total secondary smelters	35,600 r/	1,440,000	1,430,000	44,300
<b>Integrated aluminum companies, foundries, independent mill fabricators, other consumers:</b>				
New scrap:				
Solids	15,600	804,000	794,000	25,400
Borings and turnings	27	28,300	27,900	375
Dross and skimmings	136	12,500	12,400	260
Other 4/	8,330	218,000	215,000	11,900
Total	24,100	1,060,000	1,050,000	37,900
Old scrap:				
Castings, sheet, clippings	7,970 r/	355,000	353,000	10,300
Aluminum-copper radiators	145 r/	2,260	2,090	314
Aluminum cans	34,600	791,000	801,000	24,900
Other 6/	340	16,700	16,500	489
Total	43,100 r/	1,170,000	1,170,000	35,900
Sweated pig	221 r/	4,390	4,270	342
Total intergrated aluminum companies, etc.	67,400 r/	2,230,000	2,230,000	74,100
<b>All scrap consumed:</b>				
New scrap:				
Solids	22,700	942,000	932,000	33,100
Borings and turnings	4,200 r/	239,000	238,000	4,970
Dross and skimmings	3,860	339,000	339,000	3,930
Other 4/	10,900 r/	429,000	426,000	14,600
Total	41,700 r/	1,950,000	1,930,000	56,600
Old scrap:				
Castings, sheet, clippings	21,600 r/	774,000	764,000	31,300
Aluminum-copper radiators	1,040 r/	17,900	17,800	1,160
Aluminum cans	35,200 r/	861,000	871,000	25,200
Other 6/	783	62,200	61,700	1,330
Total	58,600 r/	1,710,000	1,710,000	59,000
Sweated pig	2,720 r/	9,940	9,860	2,800
Total of all scrap consumed	103,000 r/	3,670,000	3,660,000	118,000

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes imported scrap. According to reporting companies, 15.51% of total receipts of aluminum-base scrap, or 567,000 metric tons, was received on toll arrangements.

3/ Includes inventory adjustment.

4/ Includes data on foil, can stock clippings, and other miscellaneous.

5/ Used beverage cans toll treated for primary producers are included in secondary smelter tabulation.

6/ Includes municipal wastes (includes litter) and fragmented scrap (auto shredder).

TABLE 5  
 PRODUCTION AND SHIPMENTS OF SECONDARY ALUMINUM ALLOYS BY  
 INDEPENDENT SMELTERS IN THE UNITED STATES 1/

(Metric tons)

	1995		1996	
	Production	Net shipments 2/	Production	Net shipments 2/
<b>Diecast alloys:</b>				
13% Si, 360, etc. (0.6% Cu, maximum)	49,600	49,700	74,500	73,400
380 and variations	570,000	569,000	473,000	474,000
<b>Sand and permanent mold:</b>				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	12,900	12,500	24,100	24,000
No. 12 and variations	W	W	W	W
No. 319 and variations	86,400	85,400 r/	132,000	132,000
F-132 alloy and variations	30,900	31,000 r/	45,000	44,800
Al-Mg alloys	639	639	685	685
Al-Zn alloys	2,200	2,160	3,430	3,430
Al-Si alloys (0.6% to 2.0% Cu)	10,900	10,700 r/	9,980	10,600
Al-Cu alloys (1.5% Si, maximum)	977	980	936	937
Al-Si-Cu-Ni alloys	1,060	1,060	1,130	1,110
Other	4,280	3,750 r/	4,180	4,270
Wrought alloys: Extrusion billets	163,000	163,000	153,000	152,000
<b>Miscellaneous:</b>				
Steel deoxidation	--	--	(3/)	(3/)
Pure (97.0% Al)	--	--	--	--
Aluminum-base hardeners	5,380	4,610	93	93
Other 4/	39,600	38,500	82,700	86,000
Total	978,000	973,000	1,000,000	1,010,000
<b>Less consumption of materials other than scrap:</b>				
Primary aluminum	41,800	--	46,400	--
Primary silicon	74,900 r/	--	80,600	--
Other	3,730	--	4,930	--
Net metallic recovery from aluminum scrap and sweated pig consumed in production of secondary aluminum ingot 5/	858,000	XX	872,000	XX

r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Sand and permanent mold: Other." XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes inventory adjustment.

3/ Withheld to avoid disclosing company proprietary data; included with "Miscellaneous: Other."

4/ Includes other die-cast alloys and other miscellaneous.

5/ No allowance made for melt-loss of primary aluminum and alloying ingredients.

TABLE 6  
 DISTRIBUTION OF END-USE SHIPMENTS OF ALUMINUM PRODUCTS IN THE UNITED STATES,  
 BY INDUSTRY 1/

Industry	1995		1996	
	Quantity (thousand metric tons)	Percent of grand total	Quantity (thousand metric tons)	Percent of grand total
Containers and packaging	2,310	24.1	2,180	22.8
Building and construction	1,220	12.7	1,310	13.7
Transportation	2,610 r/	27.3 r/	2,630	27.6
Electrical	657	6.9	665	7.0
Consumer durables	621	6.5	633	6.6
Machinery and equipment	570 r/	6.0	567	5.9
Other markets	279	2.9	281	2.9
Total to domestic users	8,260 r/	86.4	8,260	86.5
Exports	1,310	13.7	1,290	13.5
Grand total	9,570 r/	100.0	9,550	100.0

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: The Aluminum Association Inc.

TABLE 7  
U.S. NET SHIPMENTS 1/ OF ALUMINUM WROUGHT AND CAST  
PRODUCTS, BY PRODUCERS 2/

(Thousand metric tons)

	1995	1996 p/
<b>Wrought products:</b>		
Sheet, plate, foil	4,900 r/	4,370
Rod, bar, pipe, tube, and shapes	1,540 r/	1,550
Rod, wire, cable	526 r/	352
Forgings (including impacts)	103	92
Powder, flake, paste	60	65
Total	7,130 r/	6,430
<b>Castings:</b>		
Sand	207	NA
Permanent and semipermanent mold	442	NA
Die	627	NA
Other	168	NA
Total	1,440	NA
Grand total	8,580	NA

p/ Preliminary. r/ Revised. NA Not available.

1/ Net shipments derived by subtracting the sum of producers' domestic receipts of each mill shape from the domestic industry's gross shipments of that shape.

2/ Data are rounded to three significant digits; may not add to totals shown.

Source: U.S. Department of Commerce.

TABLE 8  
U.S. EXPORTS OF ALUMINUM, BY COUNTRY 1/

Country or territory	Metals and alloys, crude		Plates, sheets, bars, etc. 2/		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1995:								
Armenia	--	--	--	--	--	--	--	--
Brazil	92	\$241	18,400	\$82,300	331	\$618	18,800	\$83,100
Canada	122,000	211,000	377,000	1,070,000	50,800	58,900	550,000	1,340,000
France	67	275	6,790	30,700	458	675	7,310	31,600
Georgia	--	--	--	--	--	--	--	--
Germany	320	1,030	12,500	40,500	277	1,010	13,100	42,500
Hong Kong	2,890	5,640	13,300	45,500	75,800	114,000	92,000	165,000
Italy	626	1,290	2,270	12,200	455	736	3,350	14,200
Japan	135,000	248,000	26,700	127,000	134,000	194,000	296,000	569,000
Korea, Republic of	36,900	74,600	29,400	126,000	29,400	40,400	95,700	241,000
Latvia	--	--	--	--	--	--	--	--
Mexico	33,200	68,800	101,000	314,000	14,700	20,100	149,000	403,000
Netherlands	294	701	1,410	8,990	345	648	2,050	10,300
Philippines	2,840	6,170	594	2,830	121	159	3,560	9,160
Russia	(3/)	4	86	443	1	14	87	461
Saudi Arabia	10	8	27,100	72,400	11	20	27,100	72,400
Singapore	171	509	4,500	38,500	389	780	5,060	39,800
South Africa	12	64	302	1,340	--	--	313	1,400
Taiwan	11,900	23,000	34,400	108,000	61,800	75,600	108,000	207,000
Thailand	16,200	33,300	9,980	27,800	4,520	9,540	30,700	70,600
Turkmenistan	--	--	(3/)	3	--	--	(3/)	3
Ukraine	--	--	1	6	--	--	1	6
United Kingdom	449	1,620	23,500	89,600	2,850	5,000	26,800	96,200
Uzbekistan	--	--	3	6	--	--	3	6
Venezuela	40	214	17,100	58,000	452	700	17,600	58,900
Other	6,070 r/	14,600 r/	105,000	358,000 r/	52,900	65,900	164,000	438,000
Total	369,000	690,000	812,000	2,620,000	430,000	588,000	1,610,000	3,900,000
1996:								
Armenia	--	--	23	99	--	--	23	99
Brazil	101	380	22,500	77,100	129	156	22,800	77,700
Canada	131,000	191,000	352,000	955,000	61,500	63,400	544,000	1,210,000
France	418	1,810	4,070	23,300	24	55	4,510	25,100
Georgia	--	--	7	47	--	--	7	47
Germany	343	1,170	21,900	30,600	190	216	22,400	31,900
Hong Kong	3,170	6,100	13,200	40,500	41,600	52,800	57,900	99,400
Italy	35	325	3,280	16,400	80	79	3,390	16,800
Japan	188,000	307,000	30,400	168,000	54,900	67,600	273,000	543,000
Korea, Republic of	20,500	36,200	22,000	93,200	37,800	42,400	80,200	172,000
Latvia	--	--	33	14	--	--	33	14
Mexico	48,000	80,400	105,000	333,000	17,100	21,300	170,000	435,000
Netherlands	410	432	1,710	8,740	375	458	2,500	9,630
Philippines	1,280	2,130	1,220	6,510	179	123	2,680	8,770
Russia	15	274	1	12	--	--	16	286
Saudi Arabia	32	40	18,900	53,900	--	--	18,900	53,900
Singapore	205	873	3,170	12,300	14	18	3,390	13,200
South Africa	13	105	1,500	5,520	--	--	1,520	5,620
Taiwan	8,650	14,800	12,800	45,700	48,200	42,100	69,600	103,000
Thailand	6,300	11,000	4,680	15,100	868	1,310	11,800	27,500
Turkmenistan	--	--	--	--	--	--	--	--
Ukraine	--	--	1	19	--	--	1	19
United Kingdom	706	4,550	18,300	86,700	12,700	17,400	31,700	109,000
Uzbekistan	--	--	--	--	--	--	--	--
Venezuela	46	173	11,600	33,600	418	424	12,100	34,200
Other	8,120	22,600	111,000	382,000	44,300	45,200	164,000	450,000
Total	417,000	682,000	760,000	2,390,000	320,000	355,000	1,500,000	3,420,000

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes castings, forgings, and unclassified semifabricated forms.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 9  
U.S. EXPORTS OF ALUMINUM, BY CLASS 1/

Class	1995		1996	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
<b>Crude and semicrude:</b>				
Metals and alloys, crude	369,000	\$690,000	417,000	\$682,000
Scrap	430,000	588,000	320,000	355,000
Plates, sheets, bars, strip, etc.	764,000	2,380,000	703,000	2,130,000
Castings and forgings	6,630	81,900	12,200	105,000
Semifabricated forms, n.e.c.	40,700	157,000	44,800	147,000
<b>Total</b>	<b>1,610,000</b>	<b>3,900,000</b>	<b>1,500,000</b>	<b>3,420,000</b>
<b>Manufactures:</b>				
Foil and leaf	82,600	224,000	99,700	274,000
Powders and flakes	6,130	27,500	6,340	30,800
Wire and cable	43,600	135,000	28,500	104,000
<b>Total</b>	<b>132,000</b>	<b>386,000</b>	<b>134,000</b>	<b>410,000</b>
<b>Grand total</b>	<b>1,740,000</b>	<b>4,280,000</b>	<b>1,630,000</b>	<b>3,830,000</b>

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

TABLE 10  
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS 1/

Class	1995		1996	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
<b>Crude and semicrude:</b>				
Metals and alloys, crude	1,930,000	\$3,690,000	1,910,000	\$3,040,000
Plates, sheets, strip, etc., n.e.c. 2/	497,000	1,290,000	428,000	1,050,000
Pipes, tubes, etc.	9,080	52,300	11,300	54,300
Rods and bars	116,000	301,000	59,300	179,000
Scrap	419,000	562,000	402,000	460,000
<b>Total</b>	<b>2,970,000</b>	<b>5,890,000</b>	<b>2,810,000</b>	<b>4,790,000</b>
<b>Manufactures:</b>				
Foil and leaf 3/	46,800	177,000	57,100	207,000
Flakes and powders	1,450	6,140	1,840	5,920
Wire	39,700	89,800	76,900	148,000
<b>Total</b>	<b>88,000</b>	<b>273,000</b>	<b>136,000</b>	<b>361,000</b>
<b>Grand total</b>	<b>3,060,000</b>	<b>6,170,000</b>	<b>2,940,000</b>	<b>5,150,000</b>

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes plates, sheets, circles, and disks.

3/ Excludes etched capacitor foil.

Source: Bureau of the Census.

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

Country	Metals and alloys, crude		Plates, sheets, bars, etc. 2/		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1995:								
Argentina	--	--	97	\$347	1,730	\$2,610	1,820	\$2,960
Australia	1,120	\$3,380	2,070	5,610	931	1,500	4,120	10,500
Bahrain	--	--	8,690	21,200	93	125	8,780	21,300
Belgium	10	46	4,700	14,700	143	167	4,850	14,900
Brazil	87,800	162,000	2,250	5,540	1,210	1,840	91,300	170,000
Canada	1,290,000	2,510,000	304,000	757,000	219,000	312,000	1,810,000	3,580,000
Estonia	2,290	4,390	--	--	--	--	2,290	4,390
France	2,350	8,950	13,300	53,800	1,490	1,780	17,100	64,600
Germany	2,670 r/	7,630 r/	25,000	99,600	7,140 r/	11,900 r/	34,800	119,000
Italy	35	2,030	7,870	27,900	(3/)	2	7,910	30,000
Japan	237	901	10,400	47,500	719	622	11,400	49,000
Kazakstan	3,020	4,800	--	--	--	--	3,020	4,800
Mexico	2,230	3,290	11,700	31,700	107,000	130,000	121,000	165,000
Netherlands	744	1,170	4,780	17,600	911	1,380	6,430	20,100
Norway	204	1,410	265	899	163	195	632	2,500
Russia	396,000	719,000	124,000	260,000	10,700	18,700	531,000	997,000
Slovenia	--	--	3,770	13,600	--	--	3,770	13,600
South Africa	71	362	2,940	7,110	150	127	3,170	7,600
Spain	2,590	4,350	25,900	63,700	--	--	28,500	68,100
Tajikistan	19,700	31,800	--	--	142	184	19,800	32,000
Ukraine	41	59	--	--	--	--	41	59
United Arab Emirates	292	545	--	--	890	1,400	1,180	1,940
United Kingdom	2,750	4,550	14,200	49,200	8,370	11,500	25,300	65,200
Venezuela	102,000	177,000	34,600	78,800	26,200	28,300	163,000	284,000
Other r/	20,200	39,500	20,800	90,700	32,900	37,000	74,000	167,000
Total	1,930,000	3,690,000	622,000	1,650,000	419,000	562,000	2,970,000	5,890,000
1996:								
Argentina	1,450	2,270	1,030	2,660	3,060	3,490	5,540	8,420
Australia	1,080	1,840	1,660	4,470	1,310	1,300	4,050	7,610
Bahrain	--	--	8,930	20,200	--	--	8,930	20,200
Belgium	931	1,620	5,560	15,200	80	102	6,570	17,000
Brazil	11,700	18,400	436	1,110	415	515	12,500	20,100
Canada	1,340,000	2,210,000	296,000	674,000	223,000	265,000	1,850,000	3,150,000
Estonia	--	--	--	--	--	--	--	--
France	1,040	7,130	8,480	35,100	3,950	3,740	13,500	46,000
Germany	1,100	5,080	26,700	112,000	7,840	10,900	35,700	128,000
Italy	25	1,520	9,550	30,700	62	46	9,630	32,200
Japan	353	1,130	10,300	41,700	280	466	11,000	43,300
Kazakstan	18	226	--	--	--	--	18	226
Mexico	953	1,470	13,300	35,300	73,700	80,600	88,000	117,000
Netherlands	410	766	4,640	15,200	743	962	5,790	16,900
Norway	511	1,660	3,650	7,570	--	--	4,160	9,230
Russia	402,000	559,000	11,200	21,800	9,750	11,800	423,000	593,000
Slovenia	--	--	3,510	10,900	--	--	3,510	10,900
South Africa	2,310	3,870	3,240	7,400	204	230	5,750	11,500
Spain	120	173	19,100	42,100	6	22	19,200	42,300
Tajikistan	20,000	27,400	--	--	--	--	20,000	27,400
Ukraine	4,300	5,030	8	36	--	--	4,300	5,070
United Arab Emirates	--	--	--	--	1,920	2,160	1,920	2,160
United Kingdom	2,130	2,470	18,000	66,900	13,100	15,100	33,200	84,500
Venezuela	116,000	181,000	29,700	56,600	23,600	23,700	169,000	261,000
Other	6,330	8,600	23,000	85,700	38,300	39,900	67,600	134,000
Total	1,910,000	3,040,000	498,000	1,290,000	402,000	460,000	2,810,000	4,790,000

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes circles, disks, rods, pipes, tubes, etc.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 12  
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1992	1993	1994	1995	1996 e/
Argentina	156 r/	171 r/	176 r/	184 r/	185
Australia	1,236	1,381	1,317	1,297	1,372 3/
Austria	33	--	--	--	--
Azerbaijan e/	25	20	15	10	10
Bahrain	292	448	447	451	450
Bosnia and Herzegovina e/ 4/	30	15	10	10	10
Brazil	1,193	1,172	1,185	1,188	1,190
Cameroon e/	83	87	89 r/ 3/	80	80
Canada	1,972	2,308	2,255	2,172	2,282
China e/	1,100	1,220	1,450	1,870 r/	1,780
Croatia 4/	20	26	26 r/	31 r/	30
Czechoslovakia e/ 5/ 6/	68	XX	XX	XX	XX
Egypt	178	178	188	190 e/	190
France	418	426	384 r/	365 r/	365
Germany	603	552	505	575 r/	577
Ghana	180	175	141	135	137
Greece	153	148	144	131 r/	130
Hungary	27	28	31	25 e/	25
Iceland 7/	89	94	99	100	104 3/
India 6/	496	466	472	528 r/	518
Indonesia 6/	173	206	222	220 e/	225
Iran	117	109	116 e/	118 e/	118
Italy	161	156	176	178 r/	185 3/
Japan 8/	19	18	17	18	17
Mexico 6/	25	--	--	10	11
Netherlands	227 r/	232	219	216 r/	226 3/
New Zealand	243	277	271	273	284
Norway	838 r/	887	858	847	874 3/
Poland 9/	44	47	50	56 r/	52
Romania 10/	112	116	119 r/	142 r/	140
Russia	2,700	2,820	2,670	2,722	2,800
Serbia and Montenegro 4/	67	26	7	17 r/	36
Slovakia e/ 6/ 11/	XX	60	60	60	50
Slovenia e/ 4/	85 3/	80	80	80	70
South Africa	173	175	172	210 r/	620
Spain	359	356	338	362 r/	362 3/
Suriname e/	32	30	32 r/	32 r/	32
Sweden	103 r/	82	84 r/	95 r/	98 3/
Switzerland	52	36	24	21 r/	27
Tajikistan e/	400	250	235 3/	230 3/	198
Turkey	59	59	60	62 r/	60
Ukraine e/	100 r/	100 r/	100 r/	98 r/ 3/	88
United Arab Emirates: Dubai	245	242	247	240 e/	245
United Kingdom	244	239	231	238 r/	240 3/
United States	4,042	3,695	3,299	3,375	3,577 3/
Venezuela	561	568	585	630	600
Total	19,500	19,800	19,200	19,900 r/	20,700

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

1/ World totals and estimated data are rounded to three significant digits; may not add to totals shown.

2/ Primary aluminum is defined as "The weight of liquid aluminum as tapped from pots, excluding the weight of any alloying materials as well as that of any metal produced from either returned scrap or remelted materials." International reporting practices vary from country to country, some nations conforming to the foregoing definition and others using different definitions. For those countries for which a different definition is given specifically in the source publication, that definition is provided in this table by footnote. Table includes data available through May 12, 1997.

3/ Reported figure.

4/ Primary ingot plus secondary ingot.

5/ Dissolved Dec. 31, 1992. All production for Czechoslovakia in 1992 came from Slovakia.

6/ Primary ingot.

7/ Ingot and rolling billet production.

8/ Excludes high-purity aluminum containing 99.995% or more as follows, in metric tons: 1992--19,600; 1993--20,300; 1994--23,800; 1995--28,400; and 1996--28,000 (estimated).

9/ Primary unalloyed ingot plus secondary unalloyed ingot.

10/ Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.

11/ Formerly part of Czechoslovakia; data were not reported separately until 1993.