

# ALUMINUM

By Patricia A. Plunkert

**Domestic survey data and tables were prepared by Micheal George, statistical assistant, and the world production table was prepared by Regina R. Coleman, international data coordinator.**

In 1998, 13 domestic companies operated 23 primary aluminum reduction plants, producing more than 3.7 million metric tons of metal. Montana, Oregon, and Washington accounted for 39% of the production; Maryland, New York, Ohio, and West Virginia, 22%; and other States, 39%. The value was estimated to be \$5.4 billion.

Aluminum recovered from purchased scrap decreased to approximately 3.4 million tons. Of this recovered metal, 57% came from new (manufacturing) scrap, and 43%, from old (discarded aluminum products) scrap. Aluminum used beverage can (UBC) scrap accounted for more than one-half of the reported old scrap consumption in 1998. The recycling rate for aluminum UBC's decreased to 62.8%.

Transportation and the container and packaging industries remained the largest domestic markets for aluminum products in 1998. The transportation industry accounted for an estimated 35% of domestic consumption; containers and packaging, 24%; building and construction, 15%; electrical and consumer durables, 8% each; and other uses, 10%.

U.S. imports for consumption increased significantly in 1998. Canada remained the largest shipper of aluminum materials to the United States. Shipments of crude metal and alloys from Russia, the second largest source of U.S. imports, increased dramatically and returned to a level of imports that had not been seen since 1994. Total exports from the United States also increased in 1998.

The price of primary ingot on the domestic and the international markets decreased during the year. The annual average price of primary ingot was significantly lower than that of 1997. Prices in the aluminum scrap markets paralleled the general trend of primary ingot prices during the year.

At the end of 1998, world inventories increased slightly compared with those at the end of 1997. Inventories held by the London Metal Exchange (LME) increased by about 14,000 tons; world producer total metal stocks, as reported by the International Primary Aluminium Institute (IPAI), remained essentially unchanged. U.S. inventories also increased during the year.

Primary aluminum was produced in 45 countries in 1998. The United States was the largest producer with 17% of the world total, followed by Russia with 14% and Canada with 11%. World primary metal production increased by 3% compared with that of 1997.

## Legislation and Government Programs

The Defense Logistics Agency (DLA) completed the sale of aluminum metal from the National Defense Stockpile (NDS). On April 24, the sale of 323 tons (356 short tons) exhausted the inventory of aluminum metal held by the NDS and completed

the 2-year sales program of 57,000 tons (62,900 short tons) of aluminum metal (Defense Logistics Agency, 1998).

## Production

**Primary.**—Domestic primary aluminum production, totaling 3,712,690 tons, increased by 3% compared with that in 1997 (table 1). Production data were obtained from the 13 domestic producers, all of whom responded to the request from the U.S. Geological Survey (USGS) for data. Although there were significant changes in the ownership or operating status of several domestic smelters, the overall production capacity remained essentially unchanged (table 2).

In July, the Aluminum Company of America (Alcoa) announced that the stockholders of Alumax Inc. voted to approve Alumax's merger with Alcoa. As a result of the merger, each outstanding Alumax share was converted into 0.6975 of a share of Alcoa common stock (Aluminum Company of America, 1998). The U.S. Department of Justice cleared the merger of the two companies after Alcoa agreed to sell its cast plate operations to a firm that would continue to manufacture and sell cast plate (U.S. Department of Justice, 1998). In December, Alcoa and Century Aluminum Co. announced that Century had agreed to buy Alcoa's cast aluminum plate plant in Vernon, CA. The business will be named Century Cast Plate (Platt's Metals Week, 1998g).

Alcoa also announced that its board of directors approved a change of the corporate name from Aluminum Company of America to Alcoa Inc. effective January 1, 1999 (Aluminum Company of America, 1999, p. 7).

NSA, a division of Southwire Company, reported that construction had begun on a new 50,000-ton-per-year potline at its Hawesville, KY, smelter. The \$125-million expansion, scheduled for completion in 1999, would increase capacity at the plant to about 240,000 tons per year (Metal Bulletin, 1998k).

Alcan Aluminium Ltd. began a feasibility study on the possible addition of a 60,000-ton-per-year potline at its 186,000-ton-per-year smelter in Sebree, KY. A decision on whether or not to proceed with the estimated \$200 million project was expected in 1999 (Platt's Metals Week, 1998b).

Reynolds Metals Co. announced the restart of a 41,000-ton-per-year potline at its smelter in Massena, NY, which had been idled since 1993. The restart brings the plant back to its full operating capacity of 123,000 tons per year. The restart of 47,000 tons per year of capacity at Reynolds' smelter in Longview, WA, earlier in the year also brought that smelter back to its full operating capacity of 204,000 tons per year. Reynolds reported that 74,000 tons per year of capacity was restarted at its 121,000-ton-per-year smelter in Troutdale, OR.

The Troutdale smelter had been idled since 1991 (Reynolds Metals Co., 1999, p. 6).

Norsk Hydro AS announced a 5-year extension of its tolling agreement with Goldendale Aluminum Co. through 2011. In addition, Norsk Hydro will lend Goldendale part of the money needed for a 50,000-ton expansion of the smelter casthouse and the installation of point-feeder technology in the smelter. The point-feeder technology, developed by Norsk Hydro and used at its Karmoy, Norway, smelter, was expected to increase capacity by 15% at the 168,000-ton-per-year Goldendale, WA, smelter (Platt's Metals Week, 1998h).

On September 30, Kaiser Aluminum & Chemical Corp. temporarily idled 3 of the 11 potlines at its Mead and Tacoma, WA, aluminum smelters. The curtailed potlines represented approximately 70,000 tons of annual production capacity out of a total combined capacity of 273,000 tons per year. By the end of the year, however, Kaiser announced that the two potlines at its 200,000-ton-per-year Mead smelter, representing 50,000 tons of the idled capacity, would be restarted by the end of February 1999. Preparations to restart the remaining 20,000-ton-per-year potline at the Tacoma smelter had begun, but the timing for any restart had yet to be determined (Kaiser Aluminum & Chemical Corp., 1999, p. 2).

In November, Alcoa announced a 30,000-ton-per-year production cutback at its Eastalco 174,000-ton-per-year primary aluminum smelter in Frederick, MD. Eastalco was a joint venture between Alcoa (61%) and a Japanese consortium led by Mitsui & Co. Ltd. (39%). The cutback will not affect the Mitsui partners' share of metal production (Platt's Metals Week, 1998c).

A labor dispute between Kaiser and workers represented by the United Steelworkers of America (USW) continued through the end of the year. Substantially all the hourly workforces at the Gramercy, LA, alumina refinery, the Mead and Tacoma, WA, aluminum smelters, the Trentwood, WA, rolling mill, and the Newark, OH, extrusion facility were covered by a labor agreement that expired on September 30 (Kaiser Aluminum & Chemical Corp., 1999, p. 2).

Ormet Primary Aluminum Corp. entered into a 6-year agreement with Entergy Power Marketing Corp. (EPMC) of Houston, TX, a wholesale power marketing and trading subsidiary of Entergy Corp., to manage Ormet's power requirements beginning on January 1, 2000. Through its new partnership with EPMC, Ormet will have not only the flexibility to change its power supply to optimize production operations, but also the ability to control its own power costs. The EPMC agreement replaced Ormet's contract with CNG Energy Services (Ormet Primary Aluminum Corp., 1998).

Reynolds completed the sale of its McCook, IL, sheet and plate plant to McCook Metals LLC, a company formed by Michigan Avenue Partners Inc. The plant produced aluminum products for the aircraft, aerospace, and transportation markets (Reynolds Metals Co., 1998e).

Reynolds announced that it had signed a definitive agreement to sell its Alloys can stock complex in Muscle Shoals, AL, to Wise Alloys LLC. Wise Alloys was formed by Wise Metals Co., Inc. and Avalon-Borden Companies Inc. Assets included in the sale were the Alloys rolling mill, two nearby reclamation plants that provide metal to the mill, and the Sheffield coil

coating facility (Reynolds Metals Co., 1998g).

Norandal USA Inc., the U.S. subsidiary of Noranda Aluminum Inc., announced that construction had begun on a new \$240 million, high-speed aluminum foil plant in Huntingdon, TN. The new plant, to be phased in over 5 years, was expected to have an annual capacity of close to 91,000 tons (200 million pounds) of heavy-gauge aluminum foil. Heavy-gauge foil is used for heat exchangers, radiators, and semirigid food containers (Norandal USA Inc., 1998).

Norandal and Michigan Avenue Partners signed a letter of intent for the sale of Norandal's rolling mill in Scottsboro, AL. The mill produced about 160,000 to 180,000 tons (350 million–400 million pounds) per year of hot- and cold-rolled sheet (Metal Bulletin, 1998h).

Quanex Corp. purchased Decatur Aluminum Corp., a cold-rolled aluminum sheet manufacturer in Decatur, AL. The company was renamed Nichols Aluminum Alabama and became part of Quanex's Nichols Aluminum Division, which includes an aluminum minimill in Davenport, IA, and rolling mills in Davenport and Lincolnshire, IL (Hassler, 1998).

Southwire announced that its third Southwire Continuous Rod (SCR®) aluminum rod mill was on schedule to be completed by yearend 1998. The new rod mill was expected to increase the Hawesville, KY, plant's capacity by about 20% and will permit Southwire to work with different aluminum alloys while dedicating the other two SCR lines to high-volume electrical conductor production. Rod from the new mill will be used for mechanical applications, such as weld wire, cold head wire for nails, rivets, and other products (Southwire Company, 1998).

U.S. aluminum extruder Easco Inc. announced that the casting expansion at its Ahsokie, NC, billet plant had been completed during the third quarter of 1998. Annual production capacity increased to about 95,000 tons (210 million pounds), making Easco essentially self-sufficient with respect to its billet requirements. The casting plant used primary aluminum ingot, purchased aluminum scrap, and scrap recycled from the company's extrusion plants to produce billet (Easco Inc., 1999, p. 7).

**Secondary.**—Metal recovered from new and old scrap decreased to 3.4 million tons in 1998 (table 3), according to data derived by the USGS from its "Aluminum Scrap" survey. Of the 87 companies and/or plants to which monthly or annual survey requests were sent, 59 responded, representing 90% of the total scrap consumed as listed in table 4.

According to figures released by the Aluminum Association Inc., the Can Manufacturers Institute, and the Institute of Scrap Recycling Industries, 64 billion aluminum UBC's were recycled in the United States in 1998. The recycling rate, based on the number of cans shipped during the year, was 62.8%, a modest decrease from the 66.5% recycling rate reported in 1997, although 1998 was the tenth consecutive year that the aluminum can recycling rate was greater than 60%. According to the organizations' joint press release, aluminum beverage cans produced domestically in 1998 had an average 51.4% postconsumer recycled content, the highest recycled content percentage of all packaging materials (Aluminum Association Inc., 1999).

In March, Reynolds completed the sale of its U.S. recycling

operations to Wise Recycling LLC, an affiliate of Wise Metals Co., Inc., and TOMRA Pacific, Inc., an affiliate of TOMRA Systems ASA. TOMRA Pacific acquired Reynolds recycling operations in California and 4 other Western States, and Wise Recycling acquired the remaining 23-State recycling operations (Reynolds Metals Co., 1998f). In June, TOMRA Systems signed a letter of intent to acquire a 50% interest in Wise Recycling LLC. The companies noted that the alliance would enable them to combine Wise's marketing expertise with TOMRA's knowledge of collection systems and technology (TOMRA Systems ASA, 1998).

IMCO Recycling Inc. announced that it had signed a letter of intent to purchase Alcan's aluminum alloys plant in Shelbyville, TN. The facility has the capacity to produce about 54,000 tons (120 million pounds) per year of specification aluminum alloys (IMCO Recycling Inc., 1998).

Government antitrust authorities in Canada and the United States have cleared the way for Wabash Alloys LLC to purchase three secondary aluminum plants from Philip Services Inc. The three plants involved in the \$70 million deal are the secondary alloy operation in Guelph, Ontario, the aluminum deoxidizing plant in Bellwood, VA, and the former Roth Brothers secondary alloy plant in Syracuse, NY (Metal Bulletin, 1998m).

OmniSource Corp.'s subsidiary, Superior Aluminum Alloys, announced the startup of its new secondary aluminum smelter. The New Haven, IN, plant had a production capacity of 68,000 to 82,000 tons (150 million–180 million pounds) per year and will produce a full range of casting alloys (Metal Bulletin, 1998l).

Tobian Metals Inc., a processor of aluminum drosses, began operations at a plant in Benton Harbor, MI, previously occupied by the Alreco Metals Inc. secondary aluminum smelter. Tobian reported that it had state-of-the-art, double-pass rotary furnaces and was capable of processing a wide range of aluminum alloy scrap (Worden, 1998).

Secondary aluminum producer Assorted Alloys of Tennessee, formerly Secondary Aluminum Smelters, was closed permanently. The company reported that all the plant equipment was sold at auction (American Metal Market, 1998).

## Consumption

In 1998, the transportation industry, accounting for more than 3.2 million tons of total U.S. shipments of aluminum products, remained the largest domestic consumer of aluminum (table 6). The container and packaging industry consumed approximately 2.3 million tons of aluminum. Total shipments of aluminum products to domestic users increased by approximately 4% in 1998 compared with those of 1997.

Boeing Commercial Airplane Group announced the selection of five companies to supply all its aluminum flat-rolled products and small and intermediate extrusions for the next 10 years. Under the new procurement strategy, Boeing will buy aluminum directly from the companies and then provide it to external suppliers and internal parts shops through a single distributor, TMX, a subsidiary of Thyssen Inc., N.A. The five suppliers will be Alcoa (flat-rolled products and extrusions); Century Aluminum, Kaiser, and Hoogovens Aluminium

Walzprodukte GmbH (flat-rolled products only); and Universal Alloys Co. (extrusions only) (Boeing Company, 1998).

Alcan announced the signing of a 10-year aluminum supply agreement with General Motors Corporation (GM). According to the companies, the multibillion dollar agreement will ensure the supply of metal from Alcan at competitive cost to meet GM's projected needs into the next decade. GM and Alcan will also partner in a number of joint activities, including research, design, and technology. The companies will also explore new and expanding uses for aluminum, including aluminum-intensive vehicles (Alcan Aluminium Ltd., 1998a).

Ducker Research Company Inc. released a report evaluating the use of aluminum in domestic automobiles (Wrigley, 1998). According to the report, the net use of aluminum by the automotive industry in 1999 will amount to more than 3.8 billion pounds on the basis of the production of approximately 15.4 million cars and light-duty trucks. Secondary aluminum (aluminum recovered from scrap) will represent about 63% of that quantity. The Ducker report also stated that light trucks, including pickups, sports utility vehicles, and vans, will contain an average of 256 pounds of aluminum per vehicle, compared to 241 pounds in passenger cars. Since 1977, aluminum content has increased by 150 pounds per vehicle, or 4.3% per year.

Reynolds announced the sale of its North American beverage can and can end assets to Ball Corporation. The \$746 million sale included 14 can and 2 end plants (Reynolds Metals Co., 1998b, c). In December, Ball announced plans to close the Hayward and the Rocklin, CA, plants during the first quarter of 1999. Also included in the announcement were the closures of a beverage can plant and a food can plant in China (Platt's Metals Week, 1998f).

On December 31, the 500-pound aluminum ball traditionally used atop the One Times Square Building in New York City to mark the passage of one year and the start of another ushered in the New Year for the last time. The aluminum ball will be replaced with imported Waterford crystal for next year's millennium celebration (Regan, 1998b).

## Stocks

Inventories of aluminum ingot, mill products, and scrap held by producers increased to 1.93 million tons at yearend 1998 from a revised 1.86 million tons at yearend 1997. The U.S. Department of Commerce announced that its Aluminum Ingot and Mill Products (M33-D) publication, the source of U.S. inventory data for 1997 and prior years, will be discontinued at the end of 1998. Similar data in the future will be published by the Aluminum Association. To help facilitate a smooth transition from one series to the other, the 1998 end-of-year inventory was taken from the Aluminum Association's U.S. Aluminum Industry Net Shipments and Inventories publication.

The LME reported that its U.S. warehouses held approximately 11,300 tons of primary aluminum metal ingot at yearend 1998, a dramatic increase from the 325 tons of metal held in these warehouses at yearend 1997. It also reported that aluminum alloy ingot at its U.S. warehouses at yearend 1998 totaled 1,500 tons, a significant decrease from the 7,260 tons held at yearend 1997.

On April 24, the DLA announced the sale of 323 tons (356 short tons) of aluminum metal from the NDS. This exhausted the NDS aluminum inventory, and there will be no further offerings (Defense Logistics Agency, 1998).

## Prices

The monthly average U.S. market price of primary aluminum metal, as reported by Platt's Metals Week, trended downward during the year. The monthly average price began the year at 71.9 cents per pound. By December, the monthly average had fallen to 60.1 cents per pound, a decrease of almost 12 cents per pound for the year. The average price for the year was 65.5 cents per pound, a dramatic decrease compared with the 1997 average annual price of 77.1 cents per pound (table 1).

The LME cash price for high-grade primary aluminum ingot followed the same general trend as the U.S. market price. The 1998 average annual LME cash price was 61.6 cents per pound.

Purchase prices for aluminum scrap, as quoted by American Metal Market, followed the general trend of primary ingot prices, and scrap prices closed the year at significantly 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, 43 to 44 cents per pound; old sheet and cast, 37 to 39 cents per pound; and clean, dry aluminum turnings, 35 to 37 cents per pound.

Aluminum producers' buying price range for processed and delivered UBC's, as quoted by American Metal Market, also trended downward during the year. The price range began the year at 55 to 56 cents per pound and closed the year at 44 to 45 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 1998 was 50 cents per pound, a significant decrease from the 1997 annual average of 60.3 cents per pound.

The yearend indicator prices for selected secondary aluminum ingots, as published in American Metal Market, also decreased significantly, averaging more than 16 cents per pound lower than those of 1997. The closing prices for 1998 were as follows: alloy 380 (1% zinc content), 65.05 cents per pound; alloy 360 (0.6% copper content), 70.06 cents per pound; alloy 413 (0.6% copper content), 69.94 cents per pound; and alloy 319, 67.69 cents per pound. Platt's Metals Week published an annual average U.S. price of 63.56 cents per pound for A-380 alloy (3% zinc content). The average annual LME cash price for a similar 380 alloy was 54.6 cents per pound.

## Foreign Trade

Total exports of aluminum from the United States increased slightly in 1998 compared with those of 1997 (table 8). Although exports of crude metals and alloys decreased, semifabricated materials and scrap exports increased compared with those of 1997 (table 9). Canada, Mexico, and Japan, in decreasing order of shipments, accounted for almost 70% of total U.S. exports.

Imports for consumption increased significantly in 1998 compared with those of the previous year (table 10). Canada

remained the major source country, supplying almost 60% of total imports (table 11). Russia remained the second largest supplier of aluminum materials. Imports of crude metal and alloys from Russia increased dramatically (43%) in 1998 and returned to a level of imports that had not been seen since 1994.

## World Review

World production of primary aluminum metal increased by 3% in 1998 compared with that of 1997 (table 12). Aluminum demand continued to be strong in the United States, and demand in Europe, although tempered by the Asian economic crisis, remained relatively strong. The Asian aluminum markets, however, reflected the economic and financial crises in that area.

Unwrought primary aluminum inventories held by members of the IPAI increased slightly to 1.69 million tons at yearend 1998 from 1.64 million tons at yearend 1997. IPAI total metal inventories, including secondary aluminum, at yearend 1998, remained essentially unchanged from those at yearend 1997 at 3.16 million tons.

Inventories of primary aluminum metal held by the LME also increased slightly to 636,000 tons at the end of 1998 from 622,000 tons at yearend 1997. Aluminum alloy inventory held by the LME, however, more than doubled compared with that of the previous year. Alloy inventory at yearend 1998 was 96,000 tons compared with 42,600 tons at yearend 1997.

**Australia.**—Aluminium Smelters of Victoria (AluVic) sold its 25% interest in the Portland aluminum smelter to Japan's Marubeni Corp. and China's state-owned China International Trust & Investment Corp. (CITIC), increasing their shares of the plant. After the sale, the joint owners of the 350,000-ton-per-year smelter were Alcoa (45%), Marubeni and CITIC (both 22.5%), and Eastern Aluminium Ltd. (10%) (Metal Bulletin, 1998d).

**Bahrain.**—Aluminium Bahrain (Alba) signed a \$400 million loan to finance a series of projects designed to improve operations at its primary aluminum smelter. The funds will be used to construct a new 450,000-ton-per-year coke calcining plant by 2000, a 41,000-cubic meter-per-day water desalination plant, and an upgrade to the smelter's port facilities. Alba's calcined coke requirement for carbon anodes was approximately 250,000 tons per year; therefore, 200,000 tons would be available for export (Mining Journal, 1998).

**Brazil.**—Companhia Vale do Rio Doce announced plans to expand capacity at its 345,000-ton-per-year Albras smelter by adding additional pots to the three newest of its existing potlines. Upon completion in mid-2000, the \$72 million project was expected to increase annual capacity at the smelter to 382,000 tons (Kepp, 1998b).

Valesul Alumínio SA studied plans to increase capacity at its 93,000-ton-per-year primary aluminum smelter. The \$400 million project would increase annual capacity at the smelter in two stages—one to increase capacity to 135,000 tons per year and another to increase production to 229,000 tons per year. The company stated that a decision on the 5-year expansion plan would not be made until it was sure that it had sufficient energy for the project (Kepp, 1998c).

Crown Cork Embalagens announced plans to build a 1.25-billion-can-per-year aluminum beverage can plant in southern Rio Grande do Sul by the end of 1999. Crown Cork Embalagens was a joint venture between Crown Cork & Seal and Brazil's Petropar Group (Kepp, 1998a).

**Canada.**—Alcan announced that construction had begun on a new 375,000-ton-per-year primary aluminum smelter in Alma, Quebec. The total cost was estimated to be \$1.6 billion, and construction will extend over a period of 40 months. The first cells were expected to be commissioned in the fall of 2000, and full operating capacity, 18 months later. The smelter will use Pechiney AP-30 technology and will have 432 pots in 2 lines. The Alma smelter will replace the 75,000-ton-per-year Isle Maligne smelter (Alcan Aluminium Ltd., 1998b).

Alcan selected SNC-Lavalin to conduct engineering and environmental studies for a possible 250,000-ton-per-year expansion at Alcan's 272,000-ton-per-year Kitimat smelter in British Columbia. Lavalin expected to complete the study in 18 months (Regan, 1998a).

Representatives of Alcan and unions affiliated with the Federation des Syndicats du Secteur de l'Aluminium and the USW signed labor agreements that will expire on December 31, 2003. The agreements included an 18-year operational stability agreement that committed the parties to do everything possible to renew future collective agreements without recourse to traditional leverage tools, such as strikes, lockouts, and other pressure tactics, that could have a negative impact on production and customer service. In addition, the collective agreements included a number of mechanisms aimed at, among other things, ensuring employees' job security, internal equity among all company facilities, competitive wages, a competitive employee benefits program, and ongoing improvements to collective agreements (Alcan Aluminium Ltd., 1998c).

Reynolds and the Confederation des Syndicat Nationaux signed a 5-year labor contract covering workers at the 400,000-ton-per-year primary aluminum smelter in Baie Comeau, Quebec. The new contract began on July 1 and will expire on May 31, 2003. Under the agreement, workers will receive annual wage increases that total 12.15% during the life of the contract and a reduction in the retirement age from 60 to 58 (Platt's Metals Week, 1998e).

Reynolds also announced the sale of its aluminum extrusion plants, located in Richmond Hill, Ontario, and Ste. Therese, Quebec, to William L. Bonnell Co. Inc., a subsidiary of Tredegar Industries Inc. The plants produce semifabricated products destined for the building and construction, transportation, electrical, machinery, and consumer durables sectors (Metal Bulletin, 1998j).

**China.**—China National Nonferrous Metals Industry Corp. was dissolved in April and was replaced by the Nonferrous Metals Industry Bureau. Creditors' rights and liabilities were assumed by the China National Nonferrous Metals Trading Group Corp. (Metal Bulletin, 1998c).

**Dubai.**—Dubai Aluminium Co. (Dubal) announced a new \$725 million expansion project that involves the addition of a sixth potline at its 390,000-ton-per-year smelter at Jebel Ali, Dubai. The expansion project, code named Condor, began on January 1 and was expected to increase smelter capacity to 525,000 tons per year upon completion in 2000. The project

also includes a fourth anode baking kiln, new casting facilities, and the addition of two gas turbines at the company-owned powerplant (Abboud, 1998).

**Germany.**—Aluminium Essen GmbH announced the completion of its \$50 million project to rebuild the third potline at its primary aluminum smelter in Essen, Germany. The new 50,000-ton-per-year potline will increase primary metal capacity at the plant to 145,000 tons per year (Karpel, 1998).

Reynolds completed the sale of its European rolling mill businesses to VAW Aluminium AG. Included in the sale were the aluminum rolling operations of Reynolds Aluminium Deutschland, Inc. in Hamburg, Germany, Reynolds Italy Slim, S.p.A., in Cisterna di Latina, Italy, and Industria Navarra del Aluminio, S.A., in Irurzun, Spain. VAW Aluminium AG is a member of the VIAG-Group headquartered in Bonn, Germany (Reynolds Metals Co., 1998d).

**Ghana.**—A severe drought has caused serious shortages of electricity available for the 200,000-ton-per-year Volta Aluminium Co. Ltd. (Valco) smelter. Of Valco's five potlines, only one was still in operation by the middle of the year. One line had been closed in 1994, and the other three were closed in early 1998 (Metal Bulletin, 1998f). Kaiser, which owned 90% of the Valco smelter, announced that it will operate three of the smelter's five potlines in 1999. This decision was based on the power allocation that Valco received from the Volta River Authority, as well as market considerations and other factors. Valco began preparing for the restart in late 1998 and expected to have the three lines operating by February 1999 (Kaiser Aluminum & Chemical Corp., 1998).

**Greece.**—Aluminium de Grèce reported the restart of all previously idled capacity at its 150,000-ton-per-year primary aluminum smelter at St. Nicolas, Distomon, Greece. The 1994 closure was part of Pechiney's response to an oversupply of aluminum metal on the world market (Metal Bulletin, 1998b).

**Iceland.**—U.S. aluminum producer Columbia Ventures Corp. began production at its new greenfield primary aluminum smelter in Grundartangi, Iceland. The smelter, Nordic Aluminium Corp., was a three-tier project. In the first phase, the initial production capacity of 30,000 tons per year was brought on-stream in June to be increased to 60,000 tons per year by early 1999. In phase two, set to take place in 2000, extra pots will be added to bring production to 90,000 tons per year. No firm date has been set for phase three of the project, which would double annual capacity to 180,000 tons. Alumina for the smelter will be supplied through a tolling agreement signed with Billiton Plc. (Walawalker, 1998).

**India.**—National Aluminium Co. Ltd. received Government approval for an expansion at its primary aluminum smelter in Orissa. The company planned to add 240 pots in a single line in two rooms that would increase capacity from its 1998 level of 230,000 tons per year to 345,000 tons per year. Also included in the \$530 million project was an expansion of the site's captive powerplant from 720 megawatts to 840 megawatts (Metal Bulletin, 1998g).

A feasibility study to double capacity at the 30,000-ton-per-year Indian Aluminium Co. Ltd. (Indal) smelter at Hirakud has been completed. To meet the additional power requirements of the planned expansion, the company intended to sell its captive powerplant to Tata Electric Co. in exchange for an additional

77.5 megawatts of electricity (Raghuvanshi, 1998).

Alcan acquired additional shares of Indal stock and increased its ownership to 54.6% from 34.6%. Indal was a fully integrated aluminum company with mining, refining, smelting, and fabricating facilities throughout the country (Platt's Metals Week, 1998a).

**Indonesia.**—Severe drought conditions, which caused hydroelectric power shortages, forced a cutback in production at P.T. Indonesia Asahan Aluminium Co.'s primary aluminum smelter in Sumatra. By November, the smelter was operating at less than 40% of its 225,000-ton-per-year capacity (Metal Bulletin, 1998i).

**Japan.**—Furukawa Electric Co. and Sky Aluminium Co., two of Japan's largest aluminum fabricators, announced the formation of a new 50-50 joint-venture company, Aluminium Company of Furukawa & Sky (Alfus Ltd.). Alfus Ltd. will study the possible joint purchase of raw materials and machinery and the sharing of distribution, transport, and warehousing systems (Metal Bulletin, 1998e). Furukawa Electric operated aluminum rolling and extrusion facilities with an annual production capacity of about 250,000 tons, and Sky Aluminium had an annual rolling capacity of approximately 160,000 tons (Furukawa, 1998).

Nippon Light Metal Company Ltd. (NLM), Toyo Aluminium KK, and Alcan announced a complex share transaction that will result in the merger of NLM and Toyo Aluminium. In the process, Alcan's interest in NLM will decrease from 45.6% to less than 20%. NLM was Japan's sixth largest aluminum roller, and Toyo Aluminium was reputedly the world's largest maker of aluminum pastes and Japan's largest producer of aluminum foils. The merger was expected to be completed by October 1999 (Metal Bulletin, 1998a).

**Mozambique.**—Construction began on a new 250,000-ton-per-year primary aluminum smelter near Maputo. The Mozambique Aluminium Co. (Mozal) was a joint-venture project with equity provided by Billiton Plc. (47%), Mitsubishi Corp. (25%), Industrial Development Corp. of South Africa (24%), and the Government of Mozambique (4%). The smelter will consist of one potline using Pechiney's AP-30 technology. The smelter will be capable of doubling its capacity if warranted by future aluminum demand. The commissioning of the \$1.3 billion project was scheduled for 2001, and the smelter should reach full production levels by the end of 2002 (Mozambique Aluminium Co., May 14, 1998, Billiton leads largest ever investment in Mozambique with \$1.3 billion Mozal aluminium project, press release, accessed August 12, 1998, at URL <http://www.mozal.com>).

**Russia.**—Siberian Aluminum Co. (Sibalco) was building a vertically integrated group, including downstream fabrication, to serve the domestic market as it emerges. The principal components of Sibalco were the Sayansk aluminum smelter, the Sameco rolling mill, the Dmitrov beverage can plant, and the Sayanal foil plant. Metal from Sayansk was rolled at Sameco and then shipped to Dmitrov for can production. Can production at Dmitrov began in June with the opening of its first production line capable of producing 750 million cans per year. A second line, bringing production to 1.5 billion cans per year, was scheduled to open in November. Eventually, the plant will operate four production lines (Pirani, 1998).

**Spain.**—Reynolds and Alcoa announced that they had signed a definitive agreement for Alcoa to purchase Reynold's aluminum extrusion plant in Irurzun, Spain, as well as Reynolds' distribution operation for architectural systems, which had warehouses in several cities in Spain. The Irurzun plant had the capacity to produce 22,000 tons per year of soft alloy extrusions for use primarily in industrial and residential building applications (Reynolds Metals Co., 1998a).

**Sweden.**—Granges AB sold its 100,000-ton-per-year Sundsvall primary aluminum smelter to the management of Granges Metall AB, operator of the smelter, and an executive of Glencore Svierge AB. The new owners also signed a long-term agreement with metal trading company Glencore International AG for tolling production of billets and slabs (Burgert, 1998).

**Switzerland.**—Alusuisse-Lonza Holding AG announced that its Steg primary aluminum smelter would remain open until the end of 2001. Originally, the plant had been scheduled to close at the end of 1999 (Platts Metals Week, 1998d).

**Taiwan.**—Construction work to increase flat-rolled aluminum capacity by 50,000 tons per year at CS Aluminium's Kaohsiung Works continued. The expansion, which was expected to be completed within the next couple of years, would increase capacity at the plant to 130,000 tons per year. The plant produced sheet, plate, foil, and casting alloys. Nearly 90% of the company's sales was for the domestic market (McCulloch, 1998).

**Turkey.**—ETI Holding was unable to secure overseas investment partners for a planned upgrade of its Seydisehir primary aluminum smelter. The company was looking at the possibility of internal financing for the \$200 million project. A conversion of the smelter's potlines from Soderberg to prebake technology was expected to increase the plant's capacity from 60,000 tons per year to 100,000 tons per year (Carnac, 1998).

**Trinidad and Tobago.**—Norsk Hydro and the Government of Trinidad and Tobago signed a project agreement to work towards the establishment of a primary aluminum smelter in Point Lisas, Trinidad. The plan was to build a 474,000-ton-per-year smelter in two stages of 237,000 tons each; the first stage would be ready to begin metal production in 2002. Norsk Hydro had also reached agreement on basic terms for a long-term gas contract with the National Gas Company of Trinidad and Tobago to secure energy supplies for the smelter. Electricity for the plant will be supplied from a dedicated powerplant, which will be developed jointly by Norsk Hydro, Amoco Power Resources Corporation, and an internationally recognized independent power producer. Total investment for the first stage, including the smelter, cast house, powerplant, and necessary infrastructure, such as port facilities, was estimated to be \$1.5 billion (Norsk Hydro AS, 1998).

## Outlook

There have been some indications that the economic crisis in Asia may be easing a bit. Aluminum demand in the United States is expected to remain relatively strong, and the demand in Western Europe, though weaker, is expected to remain positive. World production is expected to continue to increase as smelter capacities also increase. The two greenfield smelter

projects under construction should come on-stream in the next couple of years. Additional projects are being considered such that in the near term, metal supply should be sufficient to meet overall world demand. Demand is expected to continue to grow, with the major growth area continuing to be the domestic and foreign transportation industries.

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TABLE 1  
SALIENT ALUMINUM STATISTICS 1/

(Thousand metric tons, unless otherwise specified)

	1994	1995	1996	1997	1998
<b>United States:</b>					
Primary production	3,299	3,375	3,577	3,603	3,713
Value (million dollars)	\$5,180	\$6,390	\$5,630	\$6,120	\$5,360
Price: (average cents per pound)					
U.S. market (spot)	71.2	85.9	71.3	77.1	65.5
Inventories (December 31)					
Aluminum industry 2/	2,070	2,000	1,860	1,860 r/	1,930
LME stocks in U.S. warehouses 3/	18 r/	45 r/	33 r/	8 r/	13
National Defense Stockpile	57	57	57	(4/)	--
Secondary recovery 5/	3,090	3,190	3,310	3,550 r/	3,440
New scrap	1,580	1,680	1,730	2,020 r/	1,950
Old scrap	1,500	1,510	1,570 r/	1,530	1,500
Exports (crude and semicrude)	1,370	1,610	1,500	1,570	1,590
Imports for consumption (crude and semicrude)	3,380	2,980	2,810	3,080	3,550
Aluminum industry shipments 6/	8,160	8,260	8,330	8,880	9,270
Supply, apparent 7/	8,460	7,980 r/	8,340 r/	8,740 r/	9,040
Consumption, apparent 8/	6,880	6,300 r/	6,610 r/	6,720 r/	7,090
World: Production	19,200	19,700	20,800	21,500 r/	22,100 e/

e/ Estimated. r/ Revised.

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

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/ Revised to include aluminum alloyed material.

4/ Less than 1/2 unit.

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

6/ Shipped to domestic industry.

7/ Defined as domestic primary metal production plus secondary recovery plus imports minus exports plus adjustments for Government and industry stocks changes.

8/ 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)		1998 ownership
	1997	1998	
<b>Alcan Aluminum Corp.:</b>			
Sebree, KY	186	186	Alcan Aluminium Ltd., 100%.
<b>Alcoa Inc.: 2/</b>			
Alcoa, TN	210	210	Alcoa Inc., 100%.
Badin, NC	115	115	Do.
Evansville, IN (Warrick)	300	300	Do.
Ferndale, WA (Intalco) 3/	272	272	Alcoa Inc., 61%; Mitsui & Co. Ltd., 23%; TosTem Corp., 9%; YKK Corp., 7%.
Frederick, MD (Eastalco) 3/	174	174	Do.
Massena, NY	125	125	Alcoa Inc., 100%.
Mount Holly, SC 3/	205	205	Alcoa Inc.. 50.3%; Century Aluminum Co., 26.7%; Glencore Primary Aluminum Co., 23%.
Rockdale, TX	315	315	Alcoa Inc., 100%.
Wenatchee, WA	220	220	Do.
Total	1,940 r/	1,940	
<b>Century Aluminum Co.:</b>			
Ravenswood, WV	168	168	Century Aluminum Co., 100%.
<b>Columbia Falls Aluminum Co.:</b>			
Columbia Falls, MT	168	168	Private interest, 100%
<b>Goldendale Aluminum Co.:</b>			
Goldendale, WA	168 r/	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	186	186	Southwire Co., 100%.
<b>Noranda Aluminum Inc.:</b>			
New Madrid, MO	215	220	Noranda Mines Ltd., 100%.
<b>Northwest Aluminum Corp.:</b>			
The Dalles, OR	82	82	Private interests, 100%.
<b>Ormet Primary Aluminum Corp.:</b>			
Hannibal, OH	256	256	Ormet Corp., 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	4,200 r/	4,210	

r/ Revised.

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.

3/ Alumax interest purchased by Alcoa Inc., July 1998.

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

(Metric tons)

Class	Consumption	Calculated recovery	
		Aluminum	Metallic
1997:			
Secondary smelters	1,750,000	1,240,000	1,330,000
Integrated aluminum companies	1,470,000	1,230,000	1,310,000
Independent mill fabricators	680,000 r/	588,000 r/	629,000 r/
Foundries	73,900	60,700	65,400
Other consumers	10,300	9,440	9,470
Total	3,980,000 r/	3,130,000 r/	3,340,000 r/
Estimated full industry coverage	4,230,000 r/	3,310,000 r/	3,550,000 r/
1998:			
Secondary smelters	2,080,000	1,410,000	1,520,000
Integrated aluminum companies	1,290,000	1,070,000	1,140,000
Independent mill fabricators	538,000	466,000	500,000
Foundries	72,500	59,200	63,500
Other consumers	15,000	15,000	15,000
Total	4,000,000	3,020,000	3,230,000
Estimated full industry coverage	4,270,000	3,210,000	3,440,000

r/ Revised.

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 AND SWEATED PIG IN 1998 1/ 2/

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts 3/	Consump- tion	Stocks, December 31
<b>Secondary smelters:</b>				
New scrap:				
Solids	8,260 r/	237,000	235,000	10,600
Borings and turnings	12,600 r/	303,000	303,000	12,000
Dross and skimmings	3,220 r/	595,000	597,000	2,080
Other 4/	3,480 r/	214,000	215,000	2,950
Total	27,600 r/	1,350,000	1,350,000	27,600
Old scrap:				
Castings, sheet, clippings	13,100 r/	539,000	543,000	9,040
Aluminum-copper radiators	2,400 r/	20,500	20,100	2,860
Aluminum cans 5/	2,020 r/	132,000	133,000	1,110
Other 6/	1,750	28,700	27,800	2,670
Total	19,300 r/	720,000	724,000	15,700
Sweated pig	2,400	7,220	8,750	869
Total secondary smelters	49,300 r/	2,080,000	2,080,000	44,200
<b>Integrated aluminum companies, foundries, independent mill fabricators, other consumers:</b>				
New scrap:				
Solids	16,400	778,000	772,000	21,900
Borings and turnings	259	22,000	22,000	215
Dross and skimmings	344 r/	8,690	8,860	173
Other 4/	9,590	197,000	199,000	8,420
Total	26,600	1,010,000	1,000,000	30,800
Old scrap:				
Castings, sheet, clippings	5,600 r/	135,000	135,000	5,600
Aluminum-copper radiators	515	11,400	11,400	517
Aluminum cans	26,200 r/	728,000	734,000	19,700
Other 6/	139	29,700	29,800	22
Total	32,500 r/	904,000	910,000	25,900
Sweated pig	117	3,950	3,930	138
Total integrated aluminum companies, etc.	59,200 r/	1,910,000	1,920,000	56,700
<b>All scrap consumed:</b>				
New scrap:				
Solids	24,700 r/	1,010,000	1,010,000	32,500
Borings and turnings	12,900 r/	324,000	325,000	12,200
Dross and skimmings	3,570 r/	604,000	605,000	2,260
Other 4/	13,100 r/	412,000	413,000	11,400
Total	54,200 r/	2,360,000	2,350,000	58,400
Old scrap:				
Castings, sheet, clippings	18,700 r/	674,000	678,000	14,600
Aluminum-copper radiators	2,920 r/	31,900	31,500	3,380
Aluminum cans	28,300 r/	859,000	867,000	20,800
Other 6/	1,890	58,400	57,600	2,690
Total	51,800 r/	1,620,000	1,630,000	41,500
Sweated pig	2,520	11,200	12,700	1,010
Total of all scrap consumed	109,000 r/	3,990,000	4,000,000	101,000

r/ Revised.

1/ Includes imported scrap. According to reporting companies, 28.60% of total receipts of aluminum-base scrap, or 1,140,000 metric tons, was received on toll arrangements.

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

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)

	1997		1998	
	Production	Net shipments 2/	Production	Net shipments 2/
<b>Diecast alloys:</b>				
13% Si, 360, etc. (0.6% Cu, maximum)	66,100	66,700	47,900	47,400
380 and variations	504,000	501,000	497,000	495,000
<b>Sand and permanent mold:</b>				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	36,300	35,100	55,500	55,900
No. 12 and variations	W	W	--	--
No. 319 and variations	157,000	157,000	164,000	161,000
F-132 alloy and variations	38,800	38,600	47,700	47,600
Al-Mg alloys	639	639	639	639
Al-Zn alloys	15,900	16,100	23,700	22,900
Al-Si alloys (0.6% to 2.0% Cu)	2,020	2,130	2,020	2,020
Al-Cu alloys (1.5% Si, maximum)	925	926	924	924
Al-Si-Cu-Ni alloys	1,440	1,440	990	993
Other	12,000	12,200	905	861
Wrought alloys, extrusion billets	208,000 r/	209,000	224,000	224,000
<b>Miscellaneous:</b>				
Steel deoxidation	(3/)	(3/)	(3/)	(3/)
Pure (97.0% Al)	(3/)	(3/)	(3/)	(3/)
Aluminum-base hardeners	6,430	4,770	3,600	4,290
Other 4/	91,400	91,000	119,000	119,000
Total	1,140,000	1,140,000	1,190,000	1,180,000
<b>Less consumption of materials other than scrap:</b>				
Primary aluminum	52,800 r/	--	76,800	--
Primary silicon	47,200	--	44,800	--
Other	8,410	--	9,210	--
Net metallic recovery from aluminum scrap and sweated pig consumed in production of secondary aluminum ingot 5/	1,030,000	XX	1,060,000	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.

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	1997		1998	
	Quantity (thousand metric tons)	Percent of grand total	Quantity (thousand metric tons)	Percent of grand total
Containers and packaging	2,220	21.7	2,270	21.6
Building and construction	1,320	12.9	1,390	13.2
Transportation	2,990	29.2	3,250	30.8
Electrical	708	6.9	714	6.8
Consumer durables	694	6.8	725	6.9
Machinery and equipment	626	6.1	629	6.0
Other markets	318	3.1	286	2.7
Total to domestic users	8,880	86.8	9,270	88.0
Exports e/	1,360	13.2	1,260	12.0
Grand total	10,200	100.0	10,500	100.0

e/ Estimated.

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 OF ALUMINUM WROUGHT AND CAST PRODUCTS, BY PRODUCERS 1/ 2/

(Thousand metric tons)

	1997	1998 p/
Wrought products:		
Sheet, plate, foil	4,710 r/	4,720
Rod, bar, pipe, tube, shapes	1,610 r/	1,710
Rod, wire, cable	315 r/	330
Forgings (including impacts)	97 r/	100
Powder, flake, paste	64 r/	66
Total	6,800 r/	6,930
Castings:		
Sand	153	NA
Permanent and semipermanent mold	468	NA
Die	670	NA
Other	118	NA
Total	1,410	NA
Grand total	8,210	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)
1997:								
Azerbaijan	--	--	--	--	--	--	--	--
Brazil	90	\$340	75,600	\$225,000	13	\$79	75,700	\$226,000
Canada	155,000	240,000	394,000	1,080,000	86,700	99,800	636,000	1,420,000
Croatia	--	--	--	--	--	--	--	--
Czech Republic	--	--	28	267	--	--	28	267
France	287	1,440	5,740	34,100	9	91	6,030	35,600
Germany	530	1,750	8,930	34,000	395	400	9,860	36,200
Hong Kong	4,080	7,460	20,800	55,700	31,700	43,300	56,500	106,000
Italy	57	252	3,090	12,000	20	48	3,170	12,300
Japan	95,300	160,000	37,600	162,000	35,400	47,400	168,000	370,000
Korea, Republic of	14,300	27,300	28,600	108,000	33,800	42,600	76,700	178,000
Mexico	63,000	113,000	102,000	293,000	33,400	45,600	198,000	451,000
Netherlands	85	190	1,530	8,350	67	76	1,680	8,610
Philippines	226	415	3,140	11,900	641	403	4,010	12,800
Russia	18	34	41	164	5	22	63	220
Saudi Arabia	42	32	18,100	43,500	--	--	18,200	43,600
Singapore	190	529	3,220	34,100	107	270	3,510	34,900
Slovakia	--	--	--	--	--	--	--	--
Slovenia	--	--	1	15	--	--	1	15
South Africa	179	2,720	267	1,580	--	--	446	4,300
Taiwan	9,070	16,300	14,500	46,800	61,800	64,600	85,400	128,000
Thailand	2,050	3,870	8,480	21,100	1,060	1,650	11,600	26,700
Ukraine	--	--	8	34	--	--	8	34
United Kingdom	1,460	13,100	14,600	75,600	4,760	9,090	20,800	97,800
Venezuela	96	581	9,740	27,300	383	523	10,200	28,400
Other	5,820	15,600	132,000	471,000	47,300	49,800	185,000	536,000 r/
Total	352,000	606,000	882,000	2,750,000	338,000	406,000	1,570,000	3,760,000
1998:								
Azerbaijan	--	--	18	90	--	--	18	90
Brazil	374	1,070	75,900	204,000	93	62	76,400	205,000
Canada	118,000	192,000	427,000	1,110,000	149,000	154,000	695,000	1,460,000
Croatia	2	15	--	--	--	--	2	15
Czech Republic	1	16	7	122	--	--	8	137
France	185	707	6,170	27,600	51	71	6,410	28,300
Germany	794	2,190	7,150	40,200	830	1,240	8,770	43,600
Hong Kong	917	1,550	14,800	41,100	32,000	35,000	47,800	77,600
Italy	85	325	2,530	12,100	8	11	2,630	12,500
Japan	60,600	99,900	20,700	125,000	35,800	41,700	117,000	267,000
Korea, Republic of	1,230	3,520	21,200	77,000	31,800	33,800	54,300	114,000
Mexico	75,700	127,000	150,000	443,000	63,700	74,200	289,000	644,000
Netherlands	177	380	1,190	6,320	11	61	1,380	6,760
Philippines	1	14	1,640	5,250	114	91	1,760	5,360
Russia	14	53	10	126	184	408	208	587
Saudi Arabia	--	--	6,090	18,000	--	--	6,090	18,000
Singapore	128	325	2,330	58,900	402	551	2,860	59,800
Slovakia	--	--	56	273	--	--	56	273
Slovenia	--	--	130	321	--	--	130	321
South Africa	55	106	348	1,950	--	--	404	2,050
Taiwan	1,420	2,670	12,800	44,600	54,500	48,800	68,700	96,100
Thailand	5	23	8,620	23,800	--	--	8,620	23,900
Ukraine	9	13	--	--	--	--	9	13
United Kingdom	943	5,400	12,600	71,800	514	612	14,100	77,800
Venezuela	170	346	25,000	60,200	11	30	25,200	60,500
Other	4,280	11,400	96,900	344,000	58,900	61,700	160,000	418,000
Total	265,000	449,000	893,000	2,720,000	428,000	453,000	1,590,000	3,620,000

r/ Revised.

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

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

Source: Bureau of the Census.

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

Class	1997		1998	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
<b>Crude and semicrude:</b>				
Metals and alloys, crude	352,000	\$606,000	265,000	\$449,000
Scrap	338,000	406,000	428,000	453,000
Plates, sheets, bars, strip, etc.	837,000	2,460,000	847,000	2,420,000
Castings and forgings	10,900	131,000	10,700	141,000
Semifabricated forms, n.e.c.	33,700	155,000	35,900	162,000
<b>Total</b>	<b>1,570,000</b>	<b>3,760,000</b>	<b>1,590,000</b>	<b>3,620,000</b>
<b>Manufactures:</b>				
Foil and leaf	100,000	298,000	65,400	215,000
Powders and flakes	8,770	35,800	9,010	37,400
Wire and cable	26,500	94,100	31,600	117,000
<b>Total</b>	<b>136,000</b>	<b>428,000</b>	<b>106,000</b>	<b>369,000</b>
<b>Grand total</b>	<b>1,710,000</b>	<b>4,190,000</b>	<b>1,690,000</b>	<b>3,990,000</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	1997		1998	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
<b>Crude and semicrude:</b>				
Metals and alloys, crude	2,060,000	\$3,500,000	2,400,000	\$3,660,000
Plates, sheets, strip, etc., n.e.c. 2/	461,000	1,180,000	525,000	1,300,000
Pipes, tubes, etc.	14,200	72,800	14,600	75,600
Rods and bars	85,800	266,000	110,000	339,000
Scrap	454,000	574,000	501,000	572,000
<b>Total</b>	<b>3,080,000</b>	<b>5,590,000</b>	<b>3,550,000</b>	<b>5,950,000</b>
<b>Manufactures:</b>				
Foil and leaf 3/	65,800 r/	236,000 r/	69,300	227,000
Flakes and powders	2,360	6,820	2,180	7,290
Wire	81,800	165,000	83,500	152,000
<b>Total</b>	<b>150,000 r/</b>	<b>408,000 r/</b>	<b>155,000</b>	<b>387,000</b>
<b>Grand total</b>	<b>3,230,000 r/</b>	<b>6,000,000</b>	<b>3,700,000</b>	<b>6,340,000</b>

r/ Revised.

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)
1997:								
Argentina	13,000	\$22,000	1,270	\$2,800	3,680	\$4,370	18,000	\$29,200
Australia	1,250	2,030	1,060	2,860	1,340	1,510	3,650	6,400
Bahrain	--	--	11,800	26,600	--	--	11,800	26,600
Belgium	321	690	4,600	13,100	140	184	5,060	14,000
Brazil	23,900	39,900	776	2,610	319	356	25,000	42,900
Canada	1,410,000	2,470,000	330,000	803,000	252,000	320,000	2,000,000	3,590,000
Croatia	--	--	402	1,260	--	--	402	1,260
Czech Republic	--	--	99	277	--	--	99	277
France	386	4,690	10,700	48,700	6,110	6,470	17,200	59,900
Germany	1,020	4,730	38,200	146,000	2,150	4,760	41,400	156,000
Italy	18	63	3,540 r/	12,100	16	5	3,570 r/	12,200 r/
Japan	134	581	19,600	78,000 r/	947	1,640	20,700	80,200
Korea, Republic of	65	234	358	1,740	2,140	2,840	2,560	4,810
Latvia	--	--	--	--	--	--	--	--
Mexico	1,740	3,740	13,200	34,800	84,900	107,000	99,900	145,000
Netherlands	2,370	14,500	4,960	16,800	1,480	2,140	8,810	33,400
Norway	765	2,640	1,660	2,930	--	--	2,420	5,570
Panama	--	--	376	1,150	5,040	5,600	5,420	6,750
Russia	423,000	653,000	7,640	13,000	4,670	11,600	435,000	678,000
Slovakia	422	565	--	--	--	--	422	565
Slovenia	--	--	3,520	11,700	--	--	3,520	11,700
South Africa	11,400	18,600	5,560 r/	11,500	809	980	17,800	31,100
Spain	151	307	14,300	32,700	994	1,280	15,400	34,300
Tajikistan	4,030	5,540	--	--	--	--	4,030	5,540
Ukraine	4,190	6,120	19	60	614	750	4,830	6,930
United Arab Emirates	--	--	--	--	2,460	2,910	2,460	2,910
United Kingdom	18,700	30,800	19,000	74,300	10,400	14,400	48,000	119,000
Venezuela	114,000	190,000	29,700	59,000	17,100	19,700	161,000	269,000
Other r/	28,400	31,500	39,100	119,000	56,700	65,400	124,000	216,000
Total	2,060,000	3,500,000	562,000 r/	1,520,000	454,000	574,000	3,080,000	5,590,000
1998:								
Argentina	22,900	36,500	453	940	1,750	2,100	25,100	39,500
Australia	54,300	78,300	2,630	6,860	40	47	56,900	85,200
Bahrain	1,180	1,730	14,100	30,200	65	73	15,400	32,100
Belgium	1,310	2,180	6,070	17,500	556	588	7,940	20,200
Brazil	45,700	67,100	306	1,260	9,250	9,450	55,300	77,800
Canada	1,420,000	2,240,000	371,000	850,000	270,000	306,000	2,060,000	3,400,000
Croatia	--	--	441	1,520	--	--	441	1,520
Czech Republic	--	--	264	838	--	--	264	838
France	263	4,520	13,900	73,000	7,850	6,370	22,000	83,900
Germany	1,080	5,450	51,900	205,000	1,470	1,720	54,500	212,000
Italy	7	28	4,700	16,000	223	317	4,930	16,300
Japan	387	1,500	24,400	83,400	1,340	1,480	26,100	86,300
Korea, Republic of	661	863	11,300	22,700	2,760	3,720	14,700	27,300
Latvia	--	--	14	90	--	--	14	90
Mexico	591	1,190	12,700	35,900	80,700	99,000	93,900	136,000
Netherlands	728	1,250	4,400	14,100	1,960	2,240	7,090	17,600
Norway	4,370	8,960	727	1,500	313	412	5,410	10,900
Panama	180	382	687	1,840	6,270	6,330	7,140	8,560
Russia	605,000	845,000	27,100	58,200	28,400	30,400	661,000	934,000
Slovakia	335	445	7	11	--	--	342	455
Slovenia	--	--	4,700	16,600	--	--	4,700	16,600
South Africa	15,300	21,900	3,400	7,090	469	583	19,100	29,600
Spain	--	--	8,430	19,400	1,560	1,810	9,990	21,200
Tajikistan	20,700	29,800	--	--	--	--	20,700	29,800
Ukraine	19,600	25,400	--	--	1,320	1,590	20,900	27,000
United Arab Emirates	22,700	35,500	60	129	5,040	6,320	27,800	41,900
United Kingdom	10,600	15,700	19,300	77,400	12,100	14,200	42,000	107,000
Venezuela	98,600	168,000	25,100	46,600	18,400	24,900	142,000	239,000
Other	46,600	66,200	41,700	130,000	48,900	51,700	137,000	247,000
Total	2,400,000	3,660,000	649,000	1,720,000	501,000	572,000	3,550,000	5,950,000

r/ Revised.

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

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

Source: Bureau of the Census.

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

(Thousand metric tons)

Country	1994	1995	1996	1997	1998 e/
Argentina	175	186	184 r/	184 r/	185
Australia	1,317	1,297	1,372	1,495	1,627 3/
Azerbaijan	5 r/ e/	4 r/ 3/	1 r/ 3/	5 r/ 3/	5
Bahrain	447	451	461	490 r/	499 3/
Bosnia and Herzegovina e/ 4/	10	10	10	15	15
Brazil	1,185	1,188	1,195	1,200 3/	1,200 3/
Cameroon e/	89 3/	79	82	90 r/	88
Canada	2,255	2,172	2,283	2,327	2,374 3/
China e/	1,450	1,680	1,770	1,960 r/	2,100
Croatia 4/	26	31	38	35 e/	35
Egypt	188	180	177	177 e/	178
France	438	372	380	399 r/ e/	400
Germany	505	575	576	572 r/	572
Ghana	141	135	137	152 r/	56
Greece	144	144	141	133 r/	135
Hungary	31	25 e/	30 r/	35 r/ e/	35
Iceland 5/	99	100	104	123 r/	163 3/
India 6/	472	537	531	484 r/	542 3/
Indonesia 6/	222	220 e/	225 e/	216 r/	130
Iran	116	119 r/	80 r/	92 r/	95
Italy	176	198	184	188 r/	188
Japan 7/	17	18	17	17 r/	17
Mexico 6/	--	10	61	66 r/	66
Netherlands	219	216	227	232 r/	264
New Zealand	269	273	285	310 r/	307
Nigeria	--	--	--	3 e/	20
Norway	857	847	863	919	996
Poland 8/	50	56	52 3/	52 r/ e/	51
Romania 9/	120	141	141 r/	163 r/	150
Russia	2,670	2,724	2,874	2,906	3,005 3/
Serbia and Montenegro 4/	7	17	37	66 r/	65
Slovakia e/ 6/	33	31	35	35	35
Slovenia 4/	77	58	60 e/	60 e/	50
South Africa	172	195	570 r/	673 r/	650
Spain	338	361	362	360 r/	362 3/
Suriname	27	28	32	32 e/	29 3/
Sweden	84	95	98	98 r/	96
Switzerland	24	21	27	27 r/	32 3/
Tajikistan	235	232	198	189 e/	196 3/
Turkey	60	62	62	62 r/	60
Ukraine e/	100	98 3/	90	101 3/	107 3/
United Arab Emirates: Dubai	247	240 e/	251	260 r/ e/	377 3/
United Kingdom	231	238	240	248 r/ e/	260
United States	3,299	3,375	3,577	3,603	3,713 3/
Venezuela	585	630	629 r/	634 r/	580
Total	19,200	19,700	20,800	21,500 r/	22,100

e/ Estimated. r/ Revised.

1/ World totals, U.S. data, and estimated data are rounded to three significant digits.

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 10, 1999.

3/ Reported figure.

4/ Primary ingot plus secondary ingot.

5/ Ingot and rolling billet production.

6/ Primary ingot.

7/ Excludes high-purity aluminum containing 99.995% or more as follows, in metric tons: 1994--23,800; 1995--28,400; 1996--29,400; 1997--36,100 (revised); and 1998--34,800 (estimated).

8/ Primary unalloyed ingot plus secondary unalloyed ingot.

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