



2017 Minerals Yearbook

ALUMINUM [ADVANCE RELEASE]

ALUMINUM

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During 2017, total aluminum production (primary plus aluminum recovered from scrap) in the United States decreased slightly to 4.37 million metric tons (Mt), whereas apparent consumption increased by 12% to 5.69 Mt compared with that of 2016 (table 1). The increased consumption was satisfied by increased net imports and a slight drawdown of inventories. Net imports of crude metal in 2017 were 4.55 Mt, 581,000 metric tons (t) more than in 2016, an increase of 15%. In 2016, the United States had net exports of semifabricated aluminum products of 23,000 t; whereas, in 2017, the United States had net imports of semifabricated products of 320,000 t (tables 10, 12). Total aluminum inventories in the United States stored in London Metal Exchange Ltd. (LME)-registered warehouses and by industry decreased slightly at yearend compared with those at yearend 2016 (table 1).

Domestic primary aluminum smelters produced 741,000 t of aluminum metal in 2017, 9% less than the amount in 2016 and the fifth consecutive year of decreasing production. The value of production, based on the average U.S. market price, increased to \$1.61 billion, 11% more than the value in 2016 but 60% less than the value of \$4.04 billion in 2013. The increase in value in 2017 was due to a 22% increase in price that offset the lower production. At yearend, two companies were operating a total of six primary aluminum smelters in five States. A smelter that had been on care-and-maintenance status since yearend 2016 was restarted in December. Two smelters remained on care-and-maintenance status throughout 2017, and one smelter that had been on care-and-maintenance status since 2008 was permanently shut down in December. About 57% [1.04 million metric tons per year (Mt/yr)] of domestic primary aluminum smelting capacity, including idle potlines at operating smelters, was idle at yearend (table 2). Aluminum prices generally increased throughout the year, with slight declines in June and July and again in the last 2 months of the year. Globally, consumption continued to increase, and increased production from new smelting capacity was balanced with decreases in production from shutdowns of obsolete and high-cost capacity. Combined world inventories of aluminum metal and alloys held by LME-registered warehouses decreased by 44% to 1.3 Mt from 2.31 Mt (London Metal Exchange Ltd., 2016, 2017). World primary production increased slightly to 59.8 Mt from 58.6 Mt (table 13).

The aluminum price on the LME averaged \$0.893 per pound, 23% more than that in 2016, and the 2017 annual average U.S. market price of primary aluminum ingot increased by 22% to \$0.983 per pound from \$0.804 per pound in 2016 (table 8).

Aluminum recovered from purchased and tolled scrap was 3.63 Mt in 2017, slightly more than that in 2016 (table 3). Of this recovered metal, 56% came from new (manufacturing) scrap, and 44% came from old (obsolete aluminum products) scrap (table 1). Aluminum used beverage cans (UBCs)

accounted for 41% of the old scrap consumed in 2017 and 17% of total scrap consumed (table 4).

Apparent consumption of aluminum in the United States increased by 12% compared with that in 2016. Owing to lower domestic primary production and increased consumption, the U.S. net import reliance for aluminum as a percentage of apparent consumption increased to 58% in 2017 from 51% in 2016 and was at its highest level since 2005. Producers of unwrought and semifabricated aluminum products in the United States and Canada reported that they shipped 89.1% of their products to markets in the United States and Canada and 10.9% to external markets (table 6).

Primary aluminum was produced in 41 countries in 2017. China (55%), Russia (6%), India (5%), Canada (5%), and the United Arab Emirates (4%), in decreasing order of metal produced, were the leading producers. World primary metal production increased slightly compared with the revised total of 2016. Increases in China, India, and the United Arab Emirates accounted for most of the increase in world production. The United States was the 12th-ranked producer of primary aluminum; it had been 10th in 2016, 7th in 2015, 6th in 2014, and 4th in 2013 (table 13).

Legislation and Government Programs

On January 12, the Office of the United States Trade Representative filed a complaint with the World Trade Organization against the People's Republic of China, alleging that certain practices provided subsidies to some producers of primary aluminum. According to the complaint, these companies received bank loans at interest rates that were artificially low and power at prices below market rates through state-owned enterprises of China. The complaint alleged that these practices resulted in increased capacity and production of primary aluminum in the world market, which reduced the price of aluminum, and greater market share for those companies that received the subsidies (Office of the United States Trade Representative, 2017).

In March, the Aluminum Association Trade Enforcement Working Group requested that the U.S. International Trade Commission (USITC) investigate aluminum foil imports from China. On April 21, the USITC determined that there was reasonable indication that imports of aluminum foil from China were subsidized and sold in the United States at less than fair value. Therefore, the U.S. Department of Commerce conducted antidumping and countervailing duty investigations on imports of aluminum foil from China. On August 8, the U.S. Department of Commerce announced the preliminary determination of the countervailing duty investigation, which determined that exporters of foil from China received subsidies ranging from 16.56% to 80.97%. On October 28, the U.S. Department

of Commerce announced the preliminary determination of the antidumping duty investigation, which resulted in preliminary dumping margins of 96.81% to 162.24%. The final antidumping determination was scheduled to be announced by February 23, 2018 (U.S. Department of Commerce, 2017c, d, e; U.S. International Trade Commission, 2017c).

On April 27, the President of the United States signed a memorandum instructing the Secretary of Commerce to investigate the impact of aluminum imports on national security under the authority of Section 232 of the Trade Expansion Act of 1962. If the investigation finds that aluminum was being imported in quantities or under circumstances as to threaten to impair national security, the Secretary of Commerce shall recommend actions and steps in the report to the President that need to be taken to adjust aluminum imports so that they will not threaten to impair national security. A public hearing was held on June 22 as part of the investigation. The findings were scheduled to be reported to the President in January 2018 (Home, 2017; U.S. Department of Commerce, 2017b; White House, The, 2017).

On July 7, the USITC reported the findings of its investigation of the aluminum industry that was requested by the U.S. House of Representatives Committee on Ways and Means in April 2016. The investigation examined the factors affecting competition among countries that were major unwrought and wrought aluminum producers and exporters, including the United States, as well as industry characteristics, recent trade trends, competitive strengths and weaknesses, factors related to increased capacity, and the effect of Government policies on production and trade of aluminum. The USITC also assessed the impact of foreign Government policies in select countries on their domestic production, consumption, exports, and prices of aluminum, as well as the impact on the U.S. aluminum industry and global aluminum markets (U.S. International Trade Commission, 2016; 2017a, p. 421–431; 2017b).

In November, the U.S. Department of Commerce initiated antidumping and countervailing duty investigations into imports of common aluminum alloy sheet from China. The alloys that were the subject of the investigation included 1000-series, 3000-series, and 5000-series alloys but not can stock alloys. The investigation included flat-rolled products with thickness greater than 0.2 millimeter and up to 6.3 millimeters. Markets for the subject sheet products were appliances, building and construction, electrical applications, and transportation. Preliminary determinations were scheduled to be completed in early 2018 (U.S. Department of Commerce, 2017a, f).

The Government of China ordered aluminum smelters and alumina refineries in certain areas to shut down 30% of capacity from November 15, 2017, to March 15, 2018, citing environmental concerns about pollution produced by smelters, refineries, and powerplants during the winter. Smelters and refineries in 31 cities, mainly in the central and eastern Provinces, were affected by the order (Hotter, 2017; Mok, 2017b).

Production

Primary.—Primary aluminum production in the United States was 741,000 t, 9% less than that in 2016. Domestic production

data were based on information compiled from U.S. Geological Survey (USGS) monthly surveys sent to six primary aluminum smelters owned by two companies, both of which responded and permitted the publication of the data.

On July 11, Alcoa Corp. (Pittsburgh, PA) announced that the Warrick primary aluminum smelter in Evansville, IN, would be restarted, and in December, production began from one of the potlines. Ramping up an initial 161,400 metric tons per year (t/yr) of capacity would be completed during the second quarter of 2018. The remaining 107,600 t/yr of capacity was reclassified as temporarily idle. When Alcoa shut down the 269,000-t/yr smelter in March 2016 citing high power prices and low aluminum prices, the company initially said that the shutdown would be permanent (Alcoa Corp., 2017b; Matyi, 2017a).

In December, Alcoa announced that the temporary shutdown of the primary aluminum smelter in Rockdale, TX, would be permanent. The smelter had 191,000 t/yr of capacity and was shut down in 2008 after a dispute over a power-supply contract. Associated facilities that were also permanently shut down included a casthouse and an aluminum powder plant. The limited prospect of making the smelter profitable was cited for making the shutdown permanent (Alcoa Corp., 2017a).

Secondary.—Domestic secondary aluminum production was 3.63 Mt, slightly more than that in 2016. Domestic production data were based on information compiled from USGS monthly and annual surveys sent to 53 secondary aluminum facilities. For 2017, responses were received from 33 of the facilities.

In March, Constellium N.V. (Netherlands) expanded UBC recycling capacity at its mill in Muscle Shoals, AL. The installation of a new furnace, completed in March, increased melting capacity by 77,100 t/yr. The mill produced can sheet and other rolled products from scrap (Constellium N.V., 2017).

One furnace was temporarily shut down at Spectro Alloys Corp.'s (Rosemount, MN) secondary aluminum smelter in Rosemount after a fire occurred in the baghouse on July 23. The other furnace at the smelter, which produced casting alloys from scrap, resumed production after the fire was extinguished (Baltic, 2017; Grenham, 2017). In November, Spectro started an expansion project to increase capacity and efficiency at the smelter. Installation of a furnace in a new building addition was scheduled for completion by mid-2018 (Palen, 2017).

In September, Real Alloy Holding Inc. (Sherman Oaks, CA) restarted its aluminum UBC recycling center at Morgantown, KY. The 50,000-t/yr smelter was shut down in December 2015 (Macaulay, 2017b).

Norsk Hydro ASA (Norway) temporarily shut down the casthouse at its Phoenix, AZ, plant after a fatal incident on November 8. The plant melted aluminum scrap to produce extrusion billet and aluminum extrusions. Production restarted after the accident investigation was completed (Maltais, 2017b).

Aleris International Inc. (Cleveland, OH) completed an expansion of its rolling mill in Lewisport, KY, and began commercial production of sheet for the automobile industry in November. The rolling mill capacity was 218,000 t/yr of automobile body sheet (Matyi, 2017b).

An incident at Matalco Inc.'s (Canada) secondary aluminum smelter in Lordstown, OH, was cited for the shutdown of one-half of the capacity of the 160,000-t/yr smelter. The

company did not disclose details of the incident, which took place on December 29, and no injuries were reported. The furnace was restarted on January 15, 2018. The smelter, which produced extrusion billet from recycled scrap, was completed in 2016, and production was expected to reach full capacity in 2018 (Matyi, 2017e; Maltais, 2018a, b).

Bonnell Aluminum Inc. (a subsidiary of Tredegar Corp.) completed repairs to its casthouse and resumed billet production at its extrusion plant in Newnan, GA, in the third quarter of the year. On June 29, 2016, an explosion injured five employees and shut down the casthouse. Production from the extrusion presses resumed the day after the explosion with billet obtained from other sources (Tredegar Corp., 2017a, b).

Gränges AB (Sweden) announced that it would expand capacity at its rolling mill in Huntingdon, TN, by fall 2019. The rolling mill produced aluminum foil used for air conditioning, automobile heat exchangers, and heating and ventilation applications. Gränges acquired the rolling mill in August 2016 as part of the bankruptcy restructuring of Noranda Aluminum Holding Inc. (Matyi, 2017c).

Logan Aluminum LLC (a joint venture between Novelis Corp. and Tri-Arrows Aluminum Corp.) announced that it would expand capacity at its rolling mill in Russellville, KY. The additional capacity would be used to produce sheet for the automobile industry. The project was expected to be completed in early 2019 (Matyi, 2017d).

Audubon Metals LLC was expanding the capacity of its secondary smelter in Henderson, KY. Construction of a new furnace was expected to be completed by June 2018. The amount of capacity to be added was not reported (Macaulay, 2017a).

Consumption

Apparent consumption of aluminum in the United States increased to 5.69 Mt in 2017, 12% more than that in 2016 (table 1). Shipments of aluminum ingot and semifabricated products by producers in the United States and Canada to their combined domestic markets increased by 4% in 2017 compared with the amount shipped in 2016 (table 6). Combined net United States imports of crude aluminum and semifabricated products from Canada increased by 8% compared with those in 2016. Producers of unwrought and semifabricated aluminum products in the United States and Canada reported that they shipped 89.1% of their products to markets in the United States and Canada, of which the transportation industry accounted for 39.8%; containers and packaging, 19.4%; building and construction, 13.9%; electrical, 8.4%; consumer durables, 7.8%; machinery and equipment, 7.7%; and other markets, 3%. Exports to external markets accounted for 10.9% of shipments from producers in the United States and Canada in 2017 (table 6).

Shipments of aluminum to the transportation sector increased by 3% and accounted for 35.4% of shipments in 2017 compared with 35.2% of shipments in 2016 (table 6). Aluminum shipments to the transportation sector increased even though automobile production and sales decreased in 2017 compared with those in 2016 on account of continued substitution of steel by aluminum. Total light-vehicle production in North America

in 2017 decreased 4.3% compared with that of 2016. Passenger car production decreased by 15.3%, but light-truck production increased by 2.5% compared with production in 2016. Light-vehicle production in the United States decreased by 8.6% compared with that of 2016. Total light-vehicle sales in the United States in 2017 were 17.55 million units, 1.8% less than the record-high 17.87 million units in 2016. It was the first year since 2009 that light-vehicle sales decreased in the United States (Ward's Automotive Group, 2017; Petit, 2018a, b).

Commercial aircraft deliveries increased slightly, but some suppliers reported that aluminum shipments to the aerospace industry decreased slightly as customers consumed their existing stocks. The Boeing Co. (Chicago, IL) reported that its deliveries of commercial aircraft increased slightly in 2017 compared with deliveries in 2016. Deliveries of Boeing's aluminum-intensive commercial aircraft increased by 3% in 2017 compared with deliveries in 2016 and accounted for 82% of Boeing's commercial aircraft deliveries. Deliveries of the 787 Dreamliner—an aircraft with a fuselage and wings made from composite materials instead of aluminum, but which has a significant amount of aluminum in other parts—decreased slightly (Aleris International Inc., 2017a; Arconic Inc., 2017b; Boeing Co., The, 2018, p. 26).

Shipments of aluminum to the building and construction sector increased by 4% in 2017 from those of 2016 owing to increased residential construction (table 6). In the United States, housing starts increased by 2.5% in 2017 compared with starts in 2016, and the number of houses completed in 2017 was 8.8% more than in 2016. Total U.S. construction spending during 2017 increased by 4% compared with that in 2016, which was attributed to a 10.5% increase in spending on residential construction that was partially offset by a slight decrease in spending on the more aluminum-intensive nonresidential construction (U.S. Census Bureau, 2018a, b).

Aluminum shipments for consumer durables, electrical products, machinery and equipment, and other markets increased by 8%, 10%, 7%, and 5%, respectively, compared with those in 2016. Shipments to the containers and packaging sector decreased slightly compared with those in 2016 (table 6).

Stocks

According to data reported by The Aluminum Association Inc. (2017, 2018), United States and Canadian producers' combined inventories of aluminum ingot, mill products, and scrap increased by 5% to 1.47 Mt at yearend 2017 from 1.4 Mt at yearend 2016. The LME reported that primary aluminum metal ingot stocks in its approved U.S. warehouses decreased to 65,825 t at yearend 2017 from 264,950 t at yearend 2016, 459,950 t at yearend 2015, and 1.11 Mt at yearend 2014. At yearend 2017, LME warehouses in the United States also held 188,520 t of North American Special Aluminum Alloy Contract metal ingot, almost double the 97,380 t held at yearend 2016. Global yearend 2017 inventories of unalloyed aluminum metal held by LME-registered warehouses decreased by 50% to 1.1 Mt from 2.2 Mt at yearend 2016, and aluminum alloy inventories increased by 83% to 202,420 t from 110,360 t (London Metal Exchange Ltd., 2014, 2015, 2016, 2017).

Prices

The monthly average U.S. spot market price of primary aluminum metal, as reported by Platts Metals Week, averaged \$0.90 per pound in January and generally increased throughout the year to a monthly average of \$1.039 per pound in December. The annual average price in 2017 increased to \$0.983 per pound from \$0.804 per pound in 2016. In 2017, the annual average LME cash price increased to \$0.893 per pound from \$0.727 per pound in 2016. The indicator prices for selected secondary aluminum ingots and scrap, as published in American Metal Market, followed the same trend as primary ingot prices. Scrap prices generally followed the trend of primary aluminum prices (table 8).

Foreign Trade

In 2017, as a result of decreased primary production, net imports of unmanufactured aluminum materials [crude metal and alloys, semifabricated (plates, sheet, and bars), and scrap] increased by 25% compared with net imports in 2016 (tables 10, 12). Imports of unmanufactured aluminum increased by 15% during 2017 compared with those of 2016. Imports for consumption of crude aluminum metal and alloy increased by 14%, imports of semifabricated aluminum materials increased by 17%, and imports of scrap increased by 15%. Canada remained the leading source country, accounting for 51% of crude metal and alloys, 18% of semifabricated aluminum materials, 54% of scrap, and 45% of total unmanufactured aluminum imports in 2017. China accounted for 33% of semifabricated aluminum material imports. Mexico accounted for 24% of scrap imports. Russia and the United Arab Emirates accounted for 14% and 13%, respectively, of crude aluminum metal and alloy imports (table 12).

Exports of unmanufactured aluminum increased by 3% during 2017 compared with those of 2016 (table 10). Exports of crude aluminum and scrap increased by 5% and 16%, respectively, but semifabricated aluminum material exports decreased by 12%. In 2017, about 76% of United States exports of unmanufactured aluminum were shipped to Canada, China, and Mexico. Mexico and Canada were the leading destinations for semifabricated aluminum exports, receiving 41% and 39%, respectively. China accounted for 29% of unmanufactured United States aluminum exports during 2017, 96% of which were scrap (table 10).

World Industry Structure

Production.—World primary aluminum production increased slightly in 2017 compared with that of 2016 owing to increased production in China, India, and the United Arab Emirates. These gains were partially offset by smelter closures in Australia, Oman, and the United States as a result of power failures and high power costs. China was the leading producer and accounted for 55% of global primary aluminum production. Russia, India, Canada, and the United Arab Emirates, in decreasing order of production, accounted for an additional 21% of production (table 13). Since 2000, production has increased in China by 29.9 Mt (1,069%), in India by 2.63 Mt (408%), in the United Arab Emirates by 2.13 Mt (453%), in Canada by 839,000 t (35%), and in Russia by 338,000 t (10%). Production

has decreased in Australia by 320,000 t (18%) and in the United States by 2.93 Mt (80%).

Mergers, Acquisitions, and Divestitures.—Norsk Hydro acquired the remaining 50% of Sapa Group from Orkla ASA (Norway). Sapa, a joint venture between Norsk Hydro and Orkla, produced aluminum extrusions at plants in about 40 countries, including the United States. The transaction was completed in October (Norsk Hydro ASA, 2017c, f). Norsk Hydro also agreed to acquire two extrusion plants in Brazil from Arconic Inc. The deal was expected to be completed in the first half of 2018, pending regulatory approval (Norsk Hydro ASA, 2017b).

York Capital Management, LLC (New York, NY) acquired the Adel primary aluminum smelter in the Netherlands from Klesch Aluminium Delfzijl B.V. (Netherlands) in October. Klesch filed for bankruptcy protection in August. The 150,000-t/yr smelter was producing at one-third of its capacity (Ritzen, 2017; Walker, 2017).

Real Alloy and its parent company, Real Industry, Inc., filed for Chapter 11 bankruptcy protection on November 17, citing cash flow challenges. Real Alloy was a major producer of secondary ingot used for aluminum castings. Real Alloy planned to continue production during the bankruptcy proceedings (Windsor and Allagh, 2017).

On November 13, Aleris canceled the proposed acquisition by Zhongwang USA (China) because of ongoing regulatory concerns by the Committee on Foreign Investment in the United States. Aleris, owned by private equity firms Oaktree Capital Management and Apollo Global Management LLC, entered into an agreement to be acquired by Zhongwang in August 2016 (Aleris International Inc., 2017b; Blamey, 2017b).

Huayu Mining Co. Ltd. announced in December that it had reached an agreement to acquire 50% of Tajik Aluminum Co. (TALCO). TALCO owned the 520,000-t/yr Tursunzade smelter. The deal was expected to be completed in 2018, pending regulatory approval. The Government of Tajikistan would continue to own the other 50% of the company (China Metal Market—Alumina and Aluminum, 2018a).

World Review

Australia.—On January 19, Alcoa restarted capacity at the 385,000-t/yr smelter in Portland, Victoria, that was shut down after a power failure on December 1, 2016. Three weeks after the power failure, the smelter was producing at less than 30% of its capacity. Prior to the shutdown, the smelter had been producing at 85% of its capacity, and production returned to that rate by mid-October. The smelter was a joint venture of Alcoa World Alumina and Chemicals Ltd. (55%), CITIC Group Corp. Ltd. (22.5%), and Marubeni Aluminium Australia Pty Ltd. (22.5%) (Alcoa Corp., 2017c; Lim, 2017a).

Production from the Boyne Island smelter was 13% less than that in 2016. High power prices in Queensland were cited by Rio Tinto plc (United Kingdom) for the shutdown of some capacity at the 571,000-t/yr smelter. In January, about 45,000 t/yr of capacity was shut down, and about 35,000 t/yr of additional capacity was shut down in March after negotiations with power producers failed to produce a power supply contract

for 14% of the power needed to operate the smelter at full capacity (Lim, 2017b; Rio Tinto plc, 2018, p. 3, 19).

Bahrain.—On April 5, Aluminium Bahrain B.S.C. (Alba) experienced a power outage that lasted for 3 hours at its 970,000-t/yr smelter. Although four potlines resumed production at full capacity, one potline was partially shut down and resumed full production by October. Despite the temporary shutdown of some capacity, production for the year increased slightly owing to new capacity that was ramped up in the prior year. Alba continued upgrades to two potlines to improve efficiency and increase capacity of the smelter to 1.05 Mt/yr from 970,000 t/yr by yearend 2018. Construction continued on a sixth potline that would have a capacity of 540,000 t/yr when completed in 2019 (Aluminium Bahrain B.S.C., 2017a, b, 2018).

Brazil.—In July, the Government extended the elimination of a 6% tariff on unwrought primary aluminum imports through the end of June 2018. A quota of 173,000 t of unwrought primary aluminum would be permitted to be imported without payment of the tariff. Originally, the quota for the August 2016 to August 2017 period was for 240,000 t, but in February the quota was decreased to 173,000 t. In 2014, the tariff was eliminated as high power prices lead to shutdowns of primary smelting capacity, forcing manufacturers to rely on imports. Each year since then, the tariff has been eliminated for a limited amount of aluminum (Carvalho, 2014; Ribeiro, 2017a, b).

China.—Primary aluminum production in 2017 was 32.7 Mt, slightly more than the 31.9 Mt in 2016. Aluminum production generally decreased throughout the year with occasional spikes. Production was 3.14 Mt in January and decreased to 2.71 Mt in March. Production increased from March through June, reaching 2.93 Mt in June. From July through November, production generally decreased and was 2.35 Mt in November, the lowest level of the year. The Government ordered unpermitted and inefficient capacity to be shut down, contributing to the downward trend of production in the second half of the year. By October, approximately 4.3 Mt/yr of capacity had been shut down in compliance with this order. In December, production increased to 2.71 Mt. The production spike in December took place despite the Government of China ordering that smelters in 31 cities, mainly in the eastern and central Provinces, shut down 30% of their capacity from November 15, 2017, until March 15, 2018. The Government cited winter pollution control efforts for ordering the shutdowns of capacity at primary aluminum smelters, alumina refineries, and powerplants. Initially, these shutdowns were not implemented as stringently as required, and they were offset by increased production from smelters not affected by the orders and by new capacity being put into production. In order to contain smelter capacity, the Government implemented a capacity replacement quota system. To expand capacity, companies were required to purchase capacity replacement quotas from companies that had shut down older, inefficient capacity. Approximately 7 Mt/yr of smelting capacity was under construction, between 2 and 3 Mt/yr of which was not permitted. Construction of several unpermitted smelters was halted. Total smelting capacity at yearend 2017 was estimated to be 45.2 Mt/yr, 9% more than the 41.5 Mt/yr at yearend 2016. Aluminum consumption in China was estimated to be 35.4 Mt, 8% more than the 32.8 Mt consumed during 2016

(American Metal Market, 2017; China Metal Market—Alumina and Aluminum, 2017a, b, c, k, l, m; 2018d, e; Hotter, 2017; Leung, 2017; Mok, 2017b; CRU Group, 2018).

Guangxi Autonomous Region.—In September, Guangxi Hualei New Material Co. Ltd. started production at its new smelter in Pingguo County. The smelter capacity was 400,000 t/yr. In December, Baise Mining Group Co. Ltd. completed a 300,000-t/yr smelter in Tianlin County. One-third of the capacity would start production in early 2018, and the remaining capacity was expected to be started by June 2018. In June, Guangxi Yinhai Aluminum Co. Ltd. restarted 150,000 t/yr of capacity from its 200,000-t/yr smelter in Baise. The smelter production rate was only 50,000 t/yr since March 2014 because of low aluminum prices. Yinhai also was expanding its Laibin smelter to 500,000 t/yr from 250,000 t/yr. Of the new capacity, 80,000 t/yr was completed in September, and the remainder was scheduled to start production in early 2018. Suyuan Aluminum Co. Ltd. was constructing a 200,000-t/yr smelter in Baise. Production was expected to start in early 2018 after completion of one potline, and the other potline was scheduled for completion in June 2018. Jingxi Tiangui Aluminum Co. Ltd., a subsidiary of Hunan Zengshi Group Ltd., was constructing a 1-Mt/yr aluminum smelter in Jingxi County. The smelter would be completed in two stages, but a completion schedule was not available. In addition, Jingxi Tiangui was constructing a 2.5-Mt/yr alumina refinery, a powerplant, and a rolling mill adjacent to the smelter. The alumina refinery was scheduled to start production in August 2018 (China Metal Market—Alumina and Aluminum, 2017g, j; 2018a, b, c; Mok, 2017d).

Guizhou Province.—Aluminum Corp. of China Ltd. (Chalco) completed a 500,000-t/yr smelter in Qingzhen County and started production in August. Expansion to 1 Mt/yr was planned, but a construction schedule was not available (China Metal Market—Alumina and Aluminum, 2017i).

Henan Province.—In July, the government of Henan Province ordered more than 500,000 t/yr of smelting capacity to be shut down by yearend. Further shutdowns were ordered in November as part of the winter energy savings and pollution control effort (Leung, 2017; Mok, 2017b).

Inner Mongolia Autonomous Region.—In May, Huayun New Material Co. Ltd. started production from pots as they were completed at a smelter it was constructing. Chuangyuan Metal Co. Ltd. completed an 800,000-t/yr smelter in Hologol and started production in February. Mengtai Coal and Power Group Ltd. was constructing a smelter in Erdos. The first stage would have 500,000 t/yr of capacity, which was scheduled to start production by early 2018. Expansion to double the capacity of the smelter was planned, but a schedule was not available (China Metal Market—Alumina and Aluminum, 2017e, f, j).

Shandong Province.—The Provincial government required Shandong Hongqiao Group Ltd. to shut down 2.68 Mt/yr of capacity at five smelters and the associated coal-fired powerplants to comply with environmental standards. The shutdowns reportedly took effect in early August and may have included capacity that was already shut down earlier in the year. Hongqiao was reported to have about 6.5 Mt/yr of capacity producing. Hongqiao also replaced 2 Mt/yr of older, inefficient capacity at its smelters with new smelting pots to reduce

emissions, power consumption, and other costs. Shandong Xinfu Group Ltd. shut down 530,000 t/yr of smelting capacity and associated power production at the end of July (China Metal Market—Alumina and Aluminum, 2017d; Mok, 2017c, e).

Xinjiang Uygur Autonomous Region.—East Hope Nonferrous Metals Co. Ltd. shut down 800,000 t/yr of unpermitted capacity in July. The government of Xinjiang Uygur Autonomous Region ordered Qiya Aluminum and Power Co. Ltd. to shut down 800,000 t/yr of unpermitted capacity and Jiarun Resources Co. Ltd. to shut down 400,000 t/yr of unpermitted capacity. Qiya reportedly had not started production from its unpermitted capacity. Tianlong Mining Co. Ltd. completed an expansion project at its smelter in Fukang, increasing the capacity to 350,000 t/yr from 250,000 t/yr. Production from the new potline started in February (China Metal Market—Alumina and Aluminum, 2017e, h; Mok, 2017a).

Yunnan Province.—In September, Qujing Aluminum Co. Ltd. completed the restart of an idle 150,000-t/yr potline at its 380,000-t/yr smelter in Zhanyi County. The potline was shut down in 2013 owing to high power prices and low aluminum prices. A 700,000-t/yr smelter was being constructed in Zhaotong, and the first 350,000 t/yr of production was scheduled to start in 2018 (China Metal Market—Alumina and Aluminum, 2017g, j).

Germany.—In May, Norsk Hydro started commercial production from an expansion of its rolling mill in Grevenbroich. The capacity of the rolling mill was increased to 200,000 t/yr from 50,000 t/yr, and output would supply automobile manufacturers (Norsk Hydro ASA, 2017a).

India.—Primary aluminum production was 3.27 Mt in 2017, 20% more than the 2.72 Mt in 2016 because capacity that was shut down in 2016 returned to production. Vedanta Resources plc's (United Kingdom) 325,000-t/yr Korba II smelter reached full production capacity in the first quarter of the year. In September 2016, technical issues forced the shutdown of one-half of the smelting capacity. At yearend 2016, the smelter was producing at 60% capacity. In April, 228 pots at the Jharsuguda I smelter were shut down after a power failure. All of the pots were restarted by yearend. The Jharsuguda II smelter continued to ramp up after power failures in August 2016 and December 2016 forced the shutdown of the smelter. The rampup of one potline was completed in the first quarter of 2017, and rampup of another potline was completed in the fourth quarter of 2017. A third potline was being ramped up at yearend and was scheduled to be fully operational by the end of the first quarter of 2018. The restart of the fourth potline was not scheduled as of yearend 2017 (Indian Bureau of Mines, 2016, p. 32; 2017a, p. 33; 2017b, p. 35; Vedanta Resources plc, 2016, p. 7–8; 2017a, p. 9; 2017b, p. 8–9; 2018, p. 12).

Indonesia.—PT Indonesia Asahan Aluminium (Inalum) expanded the capacity of its smelter to 300,000 t/yr from 250,000 t/yr. Further expansion to 400,000 t/yr was planned by yearend 2019 (Mok, 2017f).

Italy.—Arconic sold its rolling mill in Fusina to Slim Aluminium S.p.A. in April. Arconic cited its plans to focus on supplying aerospace and automotive sheet for the sale of the rolling mill, which produced lower value sheet products (Arconic Inc., 2017a).

Netherlands.—After acquiring the Aldel smelter from Klesch Aluminium Delfzijl in October, York Capital Management planned to restart idled capacity at the 150,000-t/yr smelter. The smelter was producing at a rate of 50,000 t/yr at the time of the acquisition, and the rampup of the remaining capacity was scheduled to begin in early 2018 (Walker, 2017).

Norway.—In August, Norsk Hydro completed a 75,000-t/yr pilot plant in Karmoy to test more efficient smelting processes. The plant was designed to decrease carbon dioxide emissions by 15% compared with the industry average. Production was scheduled to start in early 2018 (Norsk Hydro ASA, 2017e).

Norsk Hydro announced that 95,000 t/yr of capacity at the Husnes smelter would be restarted, doubling the smelter's production. The potline was shut down in 2009, and Norsk Hydro had used it as a source of spare parts for other potlines. The potline would be upgraded, and production was expected to restart in 2020 (Norsk Hydro ASA, 2017d).

Oman.—A power failure took place on August 4, resulting in the shutdown of the 375,000-t/yr Sohar smelter. Production was restarted in mid-September, and the rampup was expected to be completed by April 2018. Owing to the shutdown, production decreased by 35% from that in 2016. The Sohar smelter was a joint venture between Oman Oil Co. S.a.O.C. (40%), Abu Dhabi National Energy Co. PJSC (40%), and Rio Tinto (20%) (Blamey, 2017a; Rio Tinto plc, 2018, p. 19).

United Arab Emirates.—Aluminum production increased by 4% compared with that in 2016 on account of increased capacity. Emirates Global Aluminium PJSC completed a modernization and expansion project at the Jebel Ali smelter in October. The project, which started in 2015, replaced 520 smelting pots in two potlines with pots that were more energy efficient and produced fewer emissions of perfluorocarbons. Capacity of the smelter increased by 58,000 t/yr (Emirates Global Aluminium PJSC, 2017).

Vietnam.—Tran Hong Quan Trading Co. Ltd. was building a primary aluminum smelter. The capacity of the initial potline would be 150,000 t/yr, and completion was tentatively scheduled by yearend 2018 (Lim, 2017c).

Outlook

World consumption of aluminum in 2018 is expected to increase in proportion to growth in global gross domestic product. Inventories at LME-registered warehouses are expected to remain stable after destocking during the past few years.

Primary aluminum smelters in the United States producing at yearend 2017 are expected to continue producing, and production is expected to increase moderately because some capacity that was temporarily shut down in recent years is expected to restart. The global trend of permanently closing older smelters or modernizing them in order to comply with environmental regulations, increase efficiency, and reduce costs is expected to continue, although most high-cost smelters outside of China had already been shut down by yearend 2015. Limited expansion of new capacity is expected in locations where power costs are relatively low, most notably in the Middle East and Russia. In China, construction of new capacity is expected to be limited, but the further shutdown of unprofitable capacity is not expected to be significant.

Aluminum consumption per vehicle by the domestic automobile industry is expected to increase as automobile manufacturers substitute aluminum for steel, including the substitution of aluminum sheet for steel in certain truck models, in response to increasing fuel efficiency standards. Many automobile manufacturers plan to continue increasing fuel efficiency, even though regulatory standards have been relaxed in the United States. The rate of growth in aluminum consumption per vehicle was expected to be slower than previously projected as automobile manufacturers were expected to use a combination of aluminum, magnesium, and high-strength steel to achieve fuel efficiency targets. Although some automobile manufacturers have adopted aluminum sheet, others have signaled that they favor high-strength steel sheet (Dawson, 2017; Maltais, 2017a). Because of its higher cost, the increase in aluminum sheet use in automobiles has been focused on vehicle types with high customer brand loyalty and whose users are not as price sensitive, such as light trucks, luxury sedans, sports cars, and sport utility vehicles. As manufacturers gain more experience with aluminum sheet, they are expected to introduce it in other models. Increased sales of certain aluminum-intensive light-truck and sport utility vehicle models are expected to increase aluminum consumption in the long term. In the near term, aluminum consumption by the domestic automobile industry might decrease because sales of automobiles were projected to decline slightly as interest rates increase and lending standards are tightened after several years of strong sales (Lavigne, 2017). Aluminum consumption by U.S. and European aircraft manufacturers is expected to increase as older aircraft are retired as they reach the end of useful service and as air travel increases in emerging economies. Competition from carbon composites, magnesium, and high-strength steel is expected to continue as the transportation sector seeks lighter weight materials to improve fuel efficiency; however, the aluminum industry continues to develop new aluminum alloys to compete with other materials.

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TABLE 1
SALIENT ALUMINUM STATISTICS¹

(Thousand metric tons unless otherwise specified)

	2013	2014	2015	2016	2017
United States:					
Primary production:					
Quantity	1,946	1,710	1,587	818	741
Value	\$4,042	\$3,937	\$3,085	\$1,450	\$1,611
Price, average, U.S. market, spot	94.2	104.5	88.2	80.4	98.3
Inventories, December 31:					
Aluminum industry ²	1,130	1,280	1,350	1,400	1,470
London Metal Exchange, U.S. warehouses ³	1,950	1,190	507	362	254
Secondary recovery: ⁴					
New scrap	1,790	1,870	2,000	2,010	2,050
Old scrap	1,630	1,690	1,560	1,570 ^r	1,590
Total	3,410	3,570	3,560	3,580	3,630
Exports, crude, semicrude, and scrap	3,390	3,230	3,010	2,820	2,900
Imports for consumption, crude and semicrude ⁵	4,160	4,290	4,560	5,410	6,200
Supply, apparent ⁶	6,310	6,940	7,310	7,100	7,740
Consumption, apparent ⁷	4,520	5,070	5,300	5,090	5,690
World, production	52,100 ^r	54,200	57,800 ^r	58,600 ^r	59,800

^rRevised.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits except "Primary production: Quantity and Value" and "Price, average, U.S. market, spot"; may not add to totals shown.

²Source: The Aluminum Association Inc.; includes ingot, semifabricated material, and scrap inventory levels for producers in the United States and Canada.

³Includes aluminum alloyed material.

⁴Metallic recovery from purchased, tolled, or imported new and old scrap expanded for full industry coverage.

⁵Does not include scrap.

⁶Defined as domestic primary metal production plus secondary recovery plus imports (excluding scrap) minus exports plus adjustments for London Metal Exchange (U.S. warehouses) and industry stock changes.

⁷Apparent supply less recovery from purchased new scrap.

TABLE 2
PRIMARY ANNUAL ALUMINUM PRODUCTION CAPACITY IN THE UNITED STATES, BY COMPANY¹

Company and location	Yearend capacity (thousand metric tons)		Ownership in 2017
	2016	2017	
Alcoa Corp.:			
Evansville, IN (Warrick)	269 ²	269	Alcoa Corp., 100%.
Ferndale, WA (Intalco)	279	279	Do.
Massena, NY	130	130	Do.
Rockdale, TX	191 ²	-- ³	Do.
Wenatchee, WA	184 ²	184 ²	Do.
Total	1,050	862	
Century Aluminum Co.:			
Hawesville, KY	252	252	Century Aluminum Co., 100%.
Mount Holly, SC	231	231	Do.
Sebree, KY	218	218	Do.
Total	701	701	
Magnitude 7 Metals LLC, ⁴ New Madrid, MO	263 ²	263 ²	Magnitude 7 Metals LLC, 100%.
Grand total	2,020	1,830	

Do. Ditto. -- Zero.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Temporarily idle at yearend.

³Shutdown was made permanent in December 2017.

⁴A subsidiary of ARG International AG, which purchased the smelter from Noranda Aluminum Holding Corp. on October 28, 2016.

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
2016:			
Secondary smelters	1,760,000 [†]	1,300,000 [†]	1,390,000 [†]
Independent mill fabricators	1,800,000	1,540,000	1,640,000
Foundries	84,400 [†]	72,100 [†]	77,200 [†]
Other consumers	3,550	3,540	3,540
Total	3,640,000 [†]	2,910,000 [†]	3,100,000 [†]
Estimated full industry coverage	3,910,000 [†]	3,120,000 [†]	3,580,000
2017:			
Secondary smelters	1,830,000	1,290,000	1,380,000
Independent mill fabricators	1,890,000	1,620,000	1,730,000
Foundries	84,500	72,200	77,300
Other consumers	3,200	3,200	3,200
Total	3,810,000	2,990,000	3,190,000
Estimated full industry coverage	4,090,000	3,190,000	3,630,000

[†]Revised.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Excludes recovery from other than aluminum-base scrap.

TABLE 4
U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM SCRAP IN 2017^{1,2}

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts ³	Consumption	Stocks, December 31
Secondary smelters:				
New scrap:				
Extrusions	17,600	345,000	348,000	14,600
Can stock clippings	2,950	22,500	22,700	2,800
Other wrought sheet and clippings	2,580	222,000	219,000	5,030
Casting	1,440	46,000	44,500	2,960
Borings and turnings	2,760	108,000	107,000	3,800
Dross and skimmings	7,330	492,000	490,000	10,200
Total	34,600	1,240,000	1,230,000	39,300
Old scrap:				
Castings	2,500	150,000	148,000	3,730
Extrusion	9,060	122,000	123,000	8,400
Aluminum cans ⁴	7,130	60,700	60,000	7,840
Other wrought products	5,930	152,000	153,000	5,150
Auto shredder scrap	2,130	116,000	116,000	1,820
Total	26,700	600,000	600,000	26,900
Grand total secondary smelters	61,400	1,840,000	1,830,000	66,200
Integrated aluminum companies, foundries, independent mill fabricators, other consumers:				
New scrap:				
Extrusion	1,160	460,000	460,000	1,060
Can stock clippings	1,720	204,000	203,000	2,270
Other wrought sheet and clippings	3,440	314,000	313,000	4,450
Casting	240	16,300	16,300	240
Borings and turnings	687	12,100	12,100	664
Dross and skimmings	115	1,120	1,140	94
Total	7,360	1,010,000	1,010,000	8,790
Old scrap:				
Castings	4,830	153,000	153,000	4,830
Extrusion	--	48,800	48,800	--
Aluminum cans ⁴	1,310	593,000	593,000	1,630
Other wrought products	16,300	171,000	176,000	11,500
Auto shredder scrap	520	5,280	5,170	622
Total	23,000	971,000	976,000	18,500
Grand total integrated aluminum companies, etc.	30,300	1,980,000	1,980,000	27,300
All scrap consumed:				
New scrap:				
Extrusion	18,700	805,000	809,000	15,600
Can stock clippings	4,670	226,000	226,000	5,080
Other wrought sheet and clippings	6,020	535,000	532,000	9,480
Casting	1,680	62,300	60,800	3,200
Borings and turnings	3,450	120,000	119,000	4,460
Dross and skimmings	7,440	494,000	491,000	10,200
Total	42,000	2,240,000	2,240,000	48,100
Old scrap:				
Castings	7,330	303,000	302,000	8,560
Extrusion	9,060	171,000	172,000	8,400
Aluminum cans ⁴	8,440	654,000	653,000	9,460
Other wrought products	22,200	323,000	329,000	16,600
Auto shredder scrap	2,650	121,000	121,000	2,440
Total	49,700	1,570,000	1,580,000	45,500
Grand total of all scrap consumed	91,700	3,810,000	3,810,000	93,500

-- Zero.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes imported scrap. According to reporting companies, 4.92% of total receipts of aluminum-base scrap, or 188,937 metric tons, was received on toll arrangements.

³Includes inventory adjustment.

⁴Used beverage cans toll treated for integrated producers are included in secondary smelter tabulation.

TABLE 5
PRODUCTION AND SHIPMENTS OF SECONDARY ALUMINUM ALLOYS BY INDEPENDENT SMELTERS
IN THE UNITED STATES¹

(Metric tons)

	2016		2017	
	Production	Net shipments ²	Production	Net shipments ²
Diecast alloys:				
13% Si, 360, etc. (0.6% Cu, maximum)	29,500	30,600	18,300	19,300
380 and variations	150,000	154,000 ^r	179,000	178,000
Sand and permanent mold:				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	51,300	51,400	29,800	29,900
No. 12 and variations	1,360	1,360	1,360	1,360
No. 319 and variations	35,000	35,200	44,100	44,100
F-132 alloy and variations	4,090	4,140	2,350	2,360
Al-Mg alloys	10,100	10,800	6,260	6,600
Al-Zn alloys	1,560	1,620	1,130	1,300
Al-Si alloys (0.6% to 2.0% Cu)	2,950	2,890	1,100	1,210
Al-Cu alloys (1.5% Si, maximum)	999	972	809	805
Al-Si-Cu-Ni alloys	2,460	2,480	1,540	1,630
Other	40,200	40,200	40,400	40,500
Wrought alloys, extrusion billets	778,000	758,000	658,000	678,000
Miscellaneous:				
Steel deoxidation	9,250	9,250	9,300	9,300
Pure (97.0% Al)	W	W	W	W
Other ³	117,000	111,000	69,300	74,100
Total	1,230,000	1,210,000	1,060,000	1,090,000
Less consumption of materials other than scrap:				
Primary aluminum	224,000	XX	191,000	XX
Primary silicon	29,500	XX	22,900	XX
Other	16,000	XX	12,700	XX
Net metallic recovery from aluminum scrap and sweated pig consumed in production of secondary aluminum ingot ⁴	964,000	XX	836,000	XX

^rRevised. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous, Other." XX Not applicable.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes inventory adjustment.

³Includes other diecast alloys.

⁴No 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 AND CANADA, BY INDUSTRY¹

Industry	2016		2017	
	Quantity (thousand metric tons)	Percent of grand total	Quantity (thousand metric tons)	Percent of grand total
Containers and packaging	2,160	18.0	2,130	17.3
Building and construction	1,470	12.3	1,530	12.4
Transportation	4,220	35.2	4,370	35.4
Electrical	836	7.0	919	7.5
Consumer durables	794	6.6	860	7.0
Machinery and equipment	784	6.5	841	6.8
Other markets	318 ^r	2.6	333	2.7
Total	10,600	88.2	11,000	89.1
Exports	1,410	11.8	1,340	10.9
Grand total	12,000 ^r	100	12,300	100

^rRevised.

¹Table includes data available through July 25, 2018. Data are rounded to no more than 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)

	2015	2016	2017
Wrought products:³			
Sheet, plate, foil	5,220	5,330	5,580
Pipe, tube, extruded shapes	2,460	2,490	2,580
Rod, bar, wire, cable	400	423	491
Forgings (including impacts)	158	144	158
Powder, flake, paste	71	59	59
Total	8,310	8,440	8,870
Castings:			
Sand	295	284	295
Permanent and semipermanent mold	526	505	590
Die	1,470	1,550	1,590
Other	7	17	25
Total	2,300	2,350	2,500
Grand total	10,600	10,800	11,400

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Net shipments derived by subtracting the sum of producers' domestic receipts of each mill shape from the domestic industry's gross shipments of that shape.

³Wrought products data series includes net shipments in both the United States and Canada.

Source: The Aluminum Association Inc.

TABLE 8
ALUMINUM PRICES¹

(Dollars per pound)

Material	2016	2017
Primary aluminum, average:²		
U.S. market	0.804	0.983
London Metal Exchange cash price	0.727	0.893
NASAAC ³ cash price, average	0.772	0.837
Secondary alloy, average:⁴		
A319 (3% Cu)	0.889	0.967
A356 (0.2% Cu)	0.912	0.993
A360 (0.6% Cu)	0.905	0.982
A380 (3% Zn)	0.845	0.924
A413 (0.6% Cu)	0.907	0.987
Scrap, average:⁴		
Clean, dry turnings	0.544	0.586
Mixed low-copper-content clips	0.570	0.636
Old cast	0.565	0.596
Old sheet	0.537	0.584
Used beverage cans	0.620	0.709

¹Table includes data available through July 25, 2018.

²Source: Platts Metals Week.

³North American Special Aluminum Alloy Contract.

⁴Source: American Metal Market.

TABLE 9
U.S. EXPORTS OF ALUMINUM, BY CLASS¹

Class	2016		2017	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude, semicrude, and scrap:				
Metals and alloys, crude	263,000 ^r	\$567,000 ^r	275,000	\$650,000
Scrap	1,350,000	1,890,000 ^r	1,570,000	2,340,000
Plates, sheets, bars, strip, etc.	1,130,000	4,490,000	971,000	4,220,000
Castings and forgings	17,500	322,000	23,600	350,000
Semifabricated forms, n.e.c. ²	50,900 ^r	408,000 ^r	59,900	448,000
Total	2,820,000	7,670,000 ^r	2,900,000	8,010,000
Manufactures:				
Foil and leaf	59,200 ^r	263,000	61,500	269,000
Powders and flakes	2,920 ^r	14,900 ^r	3,330	16,900
Wire and cable	35,100	126,000	32,100	126,000
Total	97,200 ^r	403,000 ^r	96,900	412,000
Grand total	2,920,000 ^r	8,080,000 ^r	2,990,000	8,420,000

^rRevised.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Not elsewhere classified.

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF ALUMINUM, BY COUNTRY OR LOCALITY¹

Country or locality	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)
2016:								
Brazil	126	\$298	5,260	\$44,200	75	\$104	5,460	\$44,600
Canada	91,500	184,000	439,000 ^r	1,510,000 ^r	109,000	202,000	640,000 ^r	1,900,000 ^r
China	489	2,030	35,200	245,000	692,000 ^r	918,000 ^r	728,000 ^r	1,170,000 ^r
France	5,900 ^r	19,700 ^r	11,700	112,000	2,800	10,200	20,300	142,000
Germany	1,470	6,070 ^r	9,540	96,500	5,090	5,140	16,100	108,000
Hong Kong	47	197	1,870	18,400	46,700 ^r	59,500 ^r	48,600 ^r	78,200 ^r
Italy	128	316	2,290	31,200 ^r	23	102	2,440	31,600 ^r
Japan	1,680	6,040	27,200	278,000	18,100	36,300	46,900	321,000
Kazakhstan	--	--	1	175	--	--	1	175
Korea, Republic of	587	3,460	33,200	260,000	146,000 ^r	191,000	180,000 ^r	455,000 ^r
Mexico	152,000 ^r	316,000 ^r	436,000	1,670,000	128,000	193,000	716,000 ^r	2,180,000
Netherlands	1,450	3,750	2,680	22,900	271	390	4,400	27,000 ^r
Philippines	1	8	428	4,810	1,760 ^r	1,550 ^r	2,180 ^r	6,370 ^r
Russia	3	40	53	1,140	2,170	5,380	2,230	6,560
Saudi Arabia	21	151	7,220	32,700	--	--	7,240	32,800
Singapore	141	1,610	2,840	32,300	--	--	2,980	33,900
South Africa	12	28	101	933 ^r	--	--	113	961 ^r
Taiwan	3,110	7,740	4,990	40,100	33,100 ^r	43,200 ^r	41,200 ^r	91,100 ^r
Thailand	159	306	5,570	29,300	3,480 ^r	4,470 ^r	9,210 ^r	34,100 ^r
United Kingdom	879	3,280	14,900	145,000	1,080 ^r	2,260 ^r	16,900	151,000
Venezuela	6 ^r	54 ^r	382 ^r	2,650 ^r	3	180	391	2,880 ^r
Other	3,360 ^r	11,900 ^r	162,000	640,000 ^r	165,000 ^r	213,000 ^r	330,000	865,000 ^r
Total	263,000 ^r	567,000 ^r	1,200,000	5,220,000 ^r	1,350,000	1,890,000 ^r	2,820,000	7,670,000 ^r
2017:								
Brazil	4,410	9,650	3,920	36,500	293	827	8,620	47,000
Canada	102,000	229,000	412,000	1,570,000	106,000	202,000	619,000	2,000,000
China	689	3,210	32,300	243,000	820,000	1,170,000	853,000	1,420,000
France	6,430	22,900	12,300	106,000	3,290	11,100	22,100	140,000
Germany	1,950	6,340	14,400	98,400	11,500	14,400	27,800	119,000
Hong Kong	30	112	2,070	20,200	50,600	76,000	52,700	96,400
Italy	74	350	2,520	33,800	1	21	2,590	34,100
Japan	2,000	7,020	16,600	184,000	16,600	37,900	35,300	229,000
Kazakhstan	--	--	14	352	--	--	14	352
Korea, Republic of	529	2,330	35,800	269,000	181,000	253,000	217,000	524,000
Mexico	142,000	325,000	437,000	1,850,000	153,000	253,000	733,000	2,420,000
Netherlands	64	501	992	13,300	2,930	6,330	3,980	20,100
Philippines	4	20	450	5,650	2,180	1,680	2,630	7,350
Russia	2	284	81	1,760	3,370	6,350	3,450	8,390
Saudi Arabia	57	321	1,250	8,090	--	--	1,300	8,410
Singapore	336	1,730	5,030	42,700	60	62	5,420	44,400
South Africa	(3)	11	76	939	1	3	77	953
Taiwan	5,100	13,000	6,230	49,400	30,200	42,600	41,500	105,000
Thailand	9	83	5,260	29,300	3,180	4,510	8,450	33,900
United Kingdom	863	3,960	14,000	121,000	830	1,800	15,700	126,000
Venezuela	50	129	34	319	12	20	96	468
Other	8,490	23,600	51,800	340,000	183,000	252,000	243,000	616,000
Total	275,000	650,000	1,050,000	5,020,000	1,570,000	2,340,000	2,900,000	8,010,000

^rRevised. -- Zero.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes castings, forgings, and unclassified semifabricated forms.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS¹

Class	2016		2017	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude, semicrude, and scrap:				
Metals and alloys, crude	4,230,000	\$7,860,000	4,830,000	\$10,400,000
Plates, sheets, strip, etc., n.e.c. ²	948,000 ^r	2,750,000	1,100,000	3,210,000
Pipes, tubes, etc.	28,700 ^r	227,000 ^r	34,200	262,000
Rods and bars	203,000	800,000 ^r	238,000	1,020,000
Scrap	609,000	806,000	700,000	1,060,000
Total	6,020,000	12,400,000	6,900,000	15,900,000
Manufactures:				
Foil and leaf ³	182,000 ^r	523,000 ^r	191,000	592,000
Powders and flakes	15,200	59,600 ^r	14,800	64,100
Wire	270,000	589,000	312,000	764,000
Total	467,000^r	1,170,000^r	518,000	1,420,000
Grand total	6,490,000^r	13,600,000^r	7,420,000	17,300,000

^rRevised.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes circles, disks, plates, and sheets; not elsewhere classified.

³Does not include etched capacitor foil.

Source: U.S. Census Bureau.

TABLE 12
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY OR LOCALITY¹

Country or locality	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)
2016:								
Argentina	174,000	\$304,000	--	--	15	\$23 [†]	174,000	\$304,000 [†]
Australia	8,470 [†]	14,600 [†]	232	\$3,110	1,320	1,730	10,000 [†]	19,500 [†]
Bahrain	107,000	195,000	51,200	134,000	--	--	158,000	329,000
Belgium	1,320	5,580	7,310	34,300	--	--	8,630	39,900
Brazil	28,300	48,100	15,000	33,000	15,800	20,700	59,200	102,000
Canada	2,300,000	4,230,000	254,000	887,000 [†]	364,000	488,000	2,920,000	5,600,000
China	2,080	6,070	369,000 [†]	931,000 [†]	801	1,250	372,000 [†]	939,000 [†]
France	9,990	86,200	16,800	93,900	1,620	387	28,400	181,000
Germany	1,720	5,290	65,300 [†]	250,000	801	980	67,800 [†]	256,000
Italy	574	1,080	10,200	47,700	289	110	11,100	48,900
Japan	6	34	29,000 [†]	124,000	474 [†]	1,260 [†]	29,500 [†]	125,000
Korea, Republic of	7,440	14,600	14,400	48,500	8,520	17,000	30,400	80,100
Mexico	11,700	18,200	43,600	189,000	133,000	168,000	188,000	375,000
Netherlands	1,450	5,030	4,230	21,500	934	1,210	6,610	27,700
Panama	35	50	71	183	5,700	7,080	5,810	7,320
Russia	721,000	1,260,000	15,600	50,700	--	--	737,000	1,310,000
South Africa	12,000	25,300	61,200	161,000	77	107	73,300	186,000
Spain	1,780	3,780	1,640 [†]	7,870 [†]	3,930	4,370	7,350 [†]	16,000
United Arab Emirates	556,000 [†]	1,030,000 [†]	1	13	1,870	1,720	558,000 [†]	1,030,000 [†]
United Kingdom	785	3,090	10,400	41,100	3,670	4,710	14,800	48,900
Venezuela	58,500 [†]	98,100	507	912	12,300	19,700	71,300 [†]	119,000
Other	232,000 [†]	513,000 [†]	209,000	714,000 [†]	54,400	67,600 [†]	496,000 [†]	1,290,000
Total	4,230,000	7,860,000	1,180,000	3,770,000	609,000	806,000	6,020,000	12,400,000
2017:								
Argentina	249,000	514,000	--	--	--	--	249,000	514,000
Australia	99,100	203,000	389	2,890	1,830	2,860	101,000	209,000
Bahrain	112,000	240,000	59,500	169,000	--	--	171,000	409,000
Belgium	1,080	5,250	8,820	42,700	--	--	9,900	47,900
Brazil	20,400	44,300	22,300	58,000	4,680	7,560	47,400	110,000
Canada	2,450,000	5,320,000	250,000	961,000	379,000	584,000	3,070,000	6,870,000
China	4,430	12,700	460,000	1,230,000	664	1,360	465,000	1,240,000
France	11,400	71,700	28,800	123,000	2,370	457	42,600	195,000
Germany	2,070	7,220	41,400	186,000	3,570	5,490	47,000	199,000
Italy	6,130	12,600	9,680	49,100	253	296	16,100	62,000
Japan	82	238	27,800	110,000	691	1,280	28,500	111,000
Korea, Republic of	1,800	4,490	15,000	57,900	13,000	22,100	29,700	84,500
Mexico	17,500	31,100	47,400	201,000	170,000	246,000	235,000	479,000
Netherlands	1,430	4,980	4,400	22,600	82	91	5,920	27,600
Panama	--	--	55	251	4,710	6,750	4,760	7,000
Russia	691,000	1,430,000	17,700	60,100	630	1,130	710,000	1,490,000
South Africa	102,000	208,000	48,800	152,000	36	51	151,000	361,000
Spain	4,180	11,100	3,590	16,500	10,200	14,300	17,900	41,900
United Arab Emirates	629,000	1,320,000	404	1,640	3,340	3,810	633,000	1,330,000
United Kingdom	849	3,840	6,360	26,500	3,230	4,910	10,400	35,300
Venezuela	79,000	158,000	3,030	5,130	17,300	30,800	99,300	194,000
Other	347,000	761,000	320,000	1,010,000	84,200	124,000	751,000	1,900,000
Total	4,830,000	10,400,000	1,370,000	4,490,000	700,000	1,060,000	6,900,000	15,900,000

[†]Revised. -- Zero.

¹Table includes data available through July 25, 2018. Data are rounded to no more than three significant digits; may not add to totals shown.

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

Source: U.S. Census Bureau.

TABLE 13
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY OR LOCALITY^{1,2}

(Thousand metric tons)

Country or locality	2013	2014	2015	2016	2017
Argentina	440	442 ^r	433 ^r	412 ^r	403
Australia	1,777	1,703	1,646	1,635 ^r	1,449
Azerbaijan	53	50	53	37 ^r	35
Bahrain	913	931	961	971	981
Bosnia and Herzegovina ³	129	126	99 ^r	107 ^r	90 ^e
Brazil	1,304	962	772	793	801
Cameroon	75	93	60 ^e	60 ^e	60 ^e
Canada	2,967	2,858	2,880	3,209	3,212
China	26,500	28,300	31,400	31,873	32,723
Egypt	307	304	300	296 ^r	300 ^e
France	346	360 ^e	420 ^e	425 ^e	429 ^e
Germany	492	531	541	547 ^r	550
Ghana ^e	37	38	40	40	35
Greece	169	173	179	181 ^r	180 ^e
Iceland	833 ^r	845 ^r	878 ^r	854 ^r	870 ^e
India	1,703	1,939	2,355	2,723	3,269
Indonesia	255	264 ^r	257 ^r	250	219
Iran	350	355	355	360 ^r	340 ^e
Japan	3 ^r	1 ^r	-- ^r	-- ^r	--
Kazakhstan	250	209	222	236 ^r	225 ^e
Malaysia	291	400 ^e	400 ^e	620	620 ^e
Montenegro	48	43	42	40 ^r	40 ^e
Mozambique	561	567	558	571	577
Netherlands	50 ^e	--	25 ^{r,e}	50 ^r	50
New Zealand	325	328	333	339	337
Nigeria	2	--	--	--	--
Norway	1,155	1,250 ^e	1,225	1,220 ^e	1,230 ^e
Oman	354	364	377	386	253
Qatar	634	640	638	612 ^r	620
Romania ⁴	250	263	271	273	270 ^e
Russia	3,601	3,300	3,529 ^r	3,561	3,583
Saudi Arabia	187	662	682 ^r	740 ^r	762
Slovakia	192	203	209	215 ^r	200 ^e
Slovenia ³	84	84	84	84 ^r	80
South Africa	822	745	695	701	716
Spain ^e	235	350	350	350	410
Sweden	131	113	116	124	123
Tajikistan	216	125	140 ^r	129 ^r	125 ^e
Turkey	32 ^r	30 ^r	46 ^r	79 ^r	80 ^e
United Arab Emirates	1,864	2,341	2,464	2,500	2,600
United Kingdom	44	42	47	48	48
United States	1,946	1,710	1,587	818	741
Venezuela	186	138	119	140	175
Total	52,100 ^r	54,200	57,800 ^r	58,600 ^r	59,800

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through June 29, 2018. All data are reported unless otherwise noted. Totals and estimated data are rounded to three significant digits; may not add to totals shown.

²Primary 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 material." International reporting practices vary from country to country, with 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, the definition is provided in a footnote.

³Primary ingot plus secondary ingot.

⁴Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.