

Alcoa and Its Customers



Customer satisfaction comes from listening, learning, understanding customer needs and continuously improving the value we provide. Our best customer relationships become long-term partnerships in quality.

Our 1990
Annual Report

**PLAINTIFF'S
EXHIBIT**

AL-199

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Beginning on page 18 is a special section featuring some of Alcoa's typical customer partnerships. The point of each story is quality—continuous improvement to increase value and gain competitive strength.

In some of these joint efforts, the customer is one of the world's great corporations. In others, the customer is simply the next person in the process, as Alcoans strive to provide other Alcoans with exactly what they need to meet world-class standards in quality and cost.

In all instances, the combined efforts of two, three or more partners are producing the steady flow of improvements that will shape Alcoa's strength in winning and holding customer loyalties for many years to come.

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Cover

Steve Carter (l), principal engineer, Boeing Commercial Airplane Group, and Pete Wright, Alcoa sales representative (See story on page 20)

Overview 1990

Financial and
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Letter to Shareholders



The success of an
equality partnership
is not an attention
to detail. AP Domet
port (Iowa) Works
furnace helper
Marcia Noble checks
an aluminum coil
being readied for
fabrication into
lithographic sheet.

AR 0871

Financial and Operating Highlights

(dollars in millions, except share amounts)

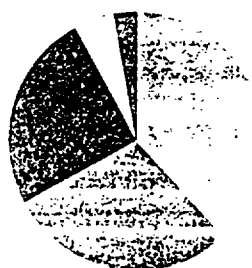
Alcoa and subsidiaries

	1990	1989	% Change
Sales	\$10,710.2	\$10,910.0	(2)%
Net income	295.2*	944.9	(69)
Per common share:			
Earnings	3.40*	10.67	(68)
Dividends paid	3.05	2.72	12
Book value	60.20	59.41	1
Total assets	11,413.2	11,540.6	(1)
Capital expenditures	850.9	875.7	(3)
Cash flow from operations	1,586.7	1,970.8	(19)
Return on shareholders' equity	5.7%†	19.1%	(70)
Debt as a percent of invested capital	16%	16%	—
Current asset/liability ratio	1.8 to 1	1.7 to 1	6
Shipments of aluminum products (000 metric tons)	2,724	2,579	6
Average common shares outstanding (000)	86,204	88,304	(2)
Average number of employees	63,700	60,600	5

* Includes a special charge of \$275.0, or \$3.19 per common share

† Excluding the special charge, the return is 10.9%

Sources of 1990 Revenues



- 38% Metals and Chemicals
- 29 Aerospace and Industrial Products
- 25 Packaging Systems
- 5 Materials Science
- 3 Other

To Alcoa Shareholders

As we have noted in the past, boom conditions in the economy do not last forever, and the events of 1990 underscored the point. While Western European and Asian economies maintained good rates of real growth, the U.S. economy deteriorated throughout the year. This was enough to shift supply/demand balances in the world aluminum industry, driving down prices, as indicated by a 16% year-to-year reduction in the average spot price of aluminum ingot. From Alcoa's perspective, the slowdown in the automotive and housing sectors of the U.S. economy had the most serious effect.

For the year 1990, Alcoa earned \$295.2 million, or \$3.40 per share. Return on average shareholders' equity was 5.7%. Revenues totaled \$10.9 billion with shipments of aluminum products at 2.72 million metric tons.

As compared with the record years of 1988 and 1989, earnings were down sharply while shipment volumes measured by weight were up 6% over 1989.

Alcoa took a one-time after-tax charge of \$275 million in the fourth quarter related to asset writedowns, environmental cleanup activities at U.S. plants and a loss on an anticipated asset sale.

Although the general trend of business conditions was down in 1990, there were important crosscurrents in our own operations that had a significant impact on the company's total results.

On the plus side, Alcoa of Australia earned \$614 million, matching the record level achieved in 1989. On the negative side, earnings in Brazil dropped from the record level of \$176 million in 1989 to \$1.3 million in 1990 as the Brazilian government pursued its program of stopping inflation, and the economy plunged into recession.

Early in 1991, order rates and prices are stabilized at fourth quarter 1990 levels and aluminum inventories are at historically low volumes. This suggests the potential for an improved pricing environment when the U.S. economy begins to recover from the recession.

Alcoa continues to have a very strong balance sheet with debt at 16% of invested capital, giving us the ability to endure economic downturns while maintaining our capital improvement program and providing the flexibility to make prudent expansion investments.

Global Expansion

1990 marked the first concrete step in our plan to expand our participation in world markets. Late in September, we announced the formation of a joint venture with Kobe Steel to produce and market sheet for the fast-growing Japanese and Asian beverage container markets. We are extremely pleased about this development because it will give us local production capacity in Japan, with state-of-the-art technology, in partnership with an established and respected company. The joint venture will build a new cold-rolling mill adjacent to Kobe Steel's Moka plant. In addition to the can stock venture, we are studying collaboration to develop aluminum products for the automotive industry and other areas of potential partnering.

Modernization

A \$1.2 billion plant and equipment modernization program that began in 1983 reached the final stage of completion in late 1990 as a new rolling mill was started up at the Davenport, Iowa plant and a new hot line was started up at the Tennessee plant. With the completion of these important milestones, 1991 will be the first year since 1983 that operations are not hampered by major construction projects. The consequence, for example, in the rigid container sheet business will be to raise our effective ability to supply the market to 1.9 billion pounds of material as compared to our actual sales in 1990 of 1.4 billion pounds. Importantly, customer demand appears to be strong enough to support this level of production, and therefore our new and welcome challenge is to utilize in a highly productive way the capacity that has been created through this multiyear investment program.

The Quality Process

Most of this annual report is devoted to illustrations of our efforts to achieve Excellence Through Quality. This is a fitting allocation of space because it reflects the priority we are giving to quality inside Alcoa and in our dealings with customers and suppliers. All of these illustrations are about people creating exceptional value through workplace teams using disciplined analytic tools and techniques. In 1990, we expanded the scope and the depth of our effort as we engaged more Alcoans in meaningful training, education and application of quality process ideas.

The Future

We continue to give first priority to achieving an injury-free workplace. Over the last three years, we have made continuing progress in improving our industry-leading safety performance as we move toward zero incidents. For example, the lost workday rate declined from 1.78 per 200,000 work hours in 1987 to 1.05 in 1990. We will achieve further gains in 1991.

Among the other issues on the horizon for Alcoa, three deserve special mention: a recent ruling by the Financial Accounting Standards Board with regard to postretirement health care benefits for employees, the status of our non-aluminum businesses and the prospects for greatly expanded use of aluminum in automobiles.

The FASB Ruling

The FASB (the accounting rule-making body in the U.S.) has issued a directive to cause all companies to change the accounting treatment for retiree health care benefits. Until the issuance of this new rule, conventional accounting practice had been to charge these medical costs as an expense on a current basis; that is, medical bills actually paid for retired employees in 1990 were charged to expense in 1990.

In the face of runaway inflation in medical care costs, the FASB has determined that companies should accrue medical and life insurance costs over the working lives of their employees. The accounting board has provided discretion in implementing the change. First, companies may implement the change now, or anytime between now and the mandatory implementation in 1993. Second, companies may "catch up" with obligations arising from the past by either charging to earnings the entire accumulated past obligation in one lump sum or charging the past obligations to earnings on a pro rata basis over a period up to 20 years. We have not yet selected the timing or the method to be used in Alcoa's case, but we have done some preliminary estimates which indicate that the lump sum value may be on the order of \$1 billion.

When this obligation is recorded in the new way mandated by the FASB, it will have the effect of reducing our equity account with a consequent change in traditional financial ratios. For example, the debt to equity ratio will go up because the equity account will be reduced. This is not a cause for alarm, but we thought it best to alert shareholders to this impending charge before it takes place.

Non-Aluminum Businesses

In 1987 we stated our belief that Alcoa's success depends fundamentally on superior competitive performance in our base aluminum business. At that time we indicated our commitment to the base business and a determination to prove the value of the then existing non-aluminum

*Paul O'Neill (l), Chairman
and Chief Executive Officer
and Fred Fetterolf,
President and Chief
Operating Officer*



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businesses rather than pursuing additional diversifications. We have continued on that course, strengthening the base businesses to develop their potential. 1991 will be an important time for our largest non-aluminum business investment, Alcoa Electronic Packaging (AEP). After four-plus years of business development—including the creation of an organization, staffing with superior people and putting in place leading-edge equipment—we will ship significant quantities of commercially competitive ceramic packages for computer integrated circuits to two major customers in the first half of 1991. This is a critical milestone for AEP, one we must pass successfully before we proceed with the next stages of investment.

Aluminum in Automobiles

Aluminum use in automobiles has grown from an average 80 lbs. per car (U.S.) in 1975 to 160 lbs. in 1990. While the growth has been substantial, it appears we may now be on the threshold of a spectacular increase in the use of aluminum for automotive applications. Some commentators in the Japanese automobile industry are predicting a 40% reduction in the weight of the average auto by the year 2000, to be achieved largely through the substitution of aluminum for steel parts. We are working to assure that we will be an important part of this prospective development.

In the meantime, we're continuing our own development efforts to supply aluminum parts for a new concept automobile spaceframe and expect to complete plans for a manufacturing facility for spaceframe parts in 1991.

Alcoans

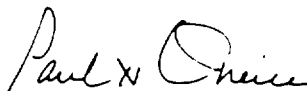
Ultimately, the future of our enterprise is in the hearts and minds and hands of the 63,000 people who call themselves Alcoans. Over the last few years we have asked them for extraordinary effort—and they have responded.

Every day has brought change:

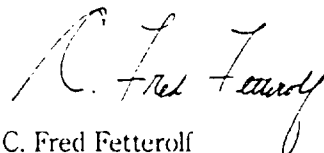
- > *Higher expectations and standards of excellence, as we have begun to set our goals by scientific limits and "best world practices" rather than by our own past performance;*
- > *Relocation of employees and families, as we have sought to strengthen the focus on internal and external customers;*
- > *The challenge of discovery, as we have asked our people to maintain the essentials of past practices while making the time to learn and use new tools and techniques that will pave our way to a superior future; and*
- > *The constant companion of uncertainty, as we have worked to identify and implement policies and practices that will enable us to live up to our Vision and Values.*

In all, our organization is in transition—from a successful past to a future where the definition of excellence is limited only by the collective imagination of our people.

We are proud to play a part in this transition and to call ourselves Alcoans.



Paul H. O'Neill
Chairman and Chief Executive Officer

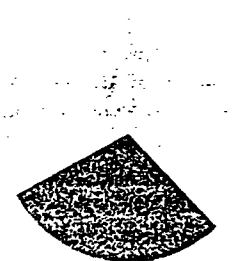


C. Fred Fetterolf
President and Chief Operating Officer

February 15, 1991

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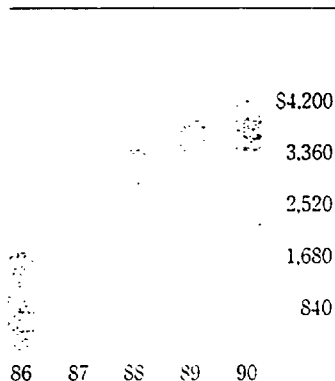
Operations Review

Sources of Revenues	Scope of Operations	Market Dynamics
Metals and Chemicals  38%	> Bauxite is mined in Australia, Brazil, Jamaica and Suriname and is refined into alumina in these countries and in the U.S. Alumina is the principal raw material used to make aluminum. > Annual consolidated primary aluminum capacity of 1.9 million metric tons (mt) is made up of 11 smelters in Australia, Brazil, Suriname and the U.S., and three affiliated smelters in Mexico and Norway. > Alumina-based chemicals are produced at 11 facilities in Australia, Brazil, Germany, Japan, The Netherlands and the U.S. > Alcoa of Australia (AA) owns and operates a gold mine in Western Australia.	> Alcoa maintains a global low-cost system of refineries and smelters. > AA is the largest low-cost alumina producer in the world. AA sells more than 70% of its alumina outside the Alcoa system. > Electricity accounts for approximately 30% of the cost of making primary aluminum. For its smelters worldwide, Alcoa generates 43% of the power used. The cost of purchased power at many Alcoa smelters is tied to aluminum prices.
Aerospace and Industrial Products  29%	> 31 plants in North America, South America and Europe fabricate aluminum sheet, plate, forgings, castings, extrusions, tube, wire, rod and bar for transportation, building, industrial and consumer applications. > 12 plants in the U.S., The Netherlands, Brazil and Mexico further process fabricated aluminum into building materials, automobile and truck components and computer memory disks. > 9 plants in the U.S. make plastic, vinyl and wood building products.	> Alcoa is the world's leading supplier of aluminum alloys for commercial aircraft, supplying virtually all aircraft manufacturers. This market continues to grow as new planes are built and existing aircraft are modernized. > Aluminum is gaining additional momentum for use in automobile engines, frames, trim and other components due to its strength and light weight, offering safety and greater fuel efficiency. > One-third of Alcoa's fabricated products are sold through independent distributors at more than 350 service centers in the U.S., Brazil, Europe and Japan.
Packaging Systems  25%	> 4 facilities in the U.S., the U.K. and Australia produce aluminum sheet for beverage cans. > 315,000 mt of used aluminum beverage cans were collected for recycling at 2,200 Alcoa-affiliated centers in the U.S. > 9 facilities in the U.S., Spain, Germany, Japan and Brazil produce aluminum and plastic closures. Cappers and related equipment are made at 3 plants in the U.S., Europe and Japan. > 7 plants in the U.S. produce food and beverage packaging equipment. > 3 facilities in the U.S., Mexico and Brazil make foil, fin stock and foil laminates.	> Alcoa is the world's leading supplier of aluminum can sheet for beverage containers and food packaging. > 96% of the 92 billion beverage cans produced in the U.S. in 1990 were aluminum. > An increase in legislation supporting environmental issues and heightened consumer awareness of aluminum's recyclability are driving forces in the growth of aluminum beverage and food cans. > Alcoa is a leading supplier of both aluminum and plastic closures. Plastic closures have now surpassed aluminum closures in the U.S. Aluminum closures still dominate the world market.
Materials Science  5%	> Alcoa Fujikura Ltd. (AFL) operates 16 plants in the U.S. and Mexico that produce electrical wiring systems and other auto components. AFL also makes fiber optic cables for telecommunications. > Alcoa Electronic Packaging, Inc. (AEP) is developing ceramic packages for computer integrated circuits at one U.S. facility. > Alcoa Composites, Inc. (ACT) manufactures composite materials for aircraft, ships and railcars at 4 U.S. facilities. > Alcoa Separations Technology, Inc. designs and makes products and systems at 5 facilities in the U.S. and Europe that purify, filter or separate materials.	> AFL designs and supplies electrical distribution systems and components to Ford Motor Company and several Japanese auto makers including Subaru. > Significant growth opportunities exist worldwide for fiber optic cable for voice, data and video communications. AFL is a leading supplier to MCI and other telecommunications companies. > AEP intends to become a leading supplier of ceramic packages for integrated circuits. > New, lightweight composite materials are being developed. These materials may compete with aluminum in some uses.

Revenues (in millions)

1990 Highlights

Looking Ahead



> Spot alumina prices declined in 1990, but remained above \$250 per mt. In response to high demand, refineries were run at full capacity. The bauxite mine and the associated high-cost alumina refinery in Bauxite, Ark. ceased operations.

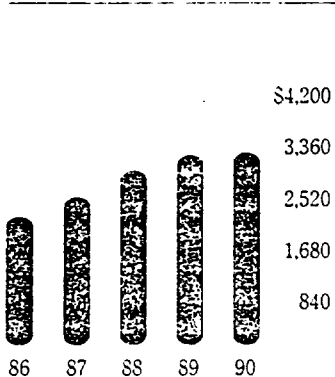
> Aluminum ingot demand remained strong in Europe and Japan. The U.S. market softened at year-end. Average representative spot prices for aluminum ingot declined from 1989 levels.

> A potline at the Wenatchee, Wash. smelter was restarted, bringing Alcoa's U.S. primary aluminum smelters to full operation.

> Construction has begun on a 630,000 mt. \$250 million expansion of AA's Wagerup alumina refinery in W. Australia. Upon completion in 1993, Wagerup's annual capacity will expand to 1.5 million mt.

> Alcoa Mineração received an environmental license from the Brazilian government to develop a bauxite mine in the Amazon region. Initial annual capacity will be 2.25 million mt. Construction begins in 1991.

> Consistent with Alcoa's environmental policy, environmental cleanup continues at most smelters and refineries.



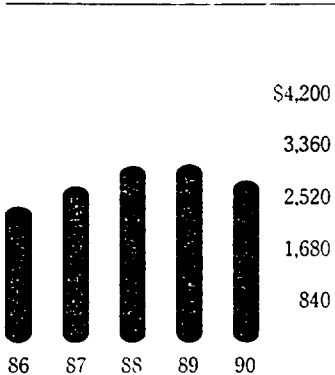
> Demand for aerospace products remained strong while softness existed in the U.S. housing and auto markets.

> Modernization of major sheet and plate facilities, including installation of a new cold mill at Davenport (Iowa) Works, was completed.

> Alcoa was chosen by Ford Motor Company to supply 100% of the aluminum for the hoods of the 1991 Crown Victoria, Grand Marquis and Lincoln Towne Car. This is the first commercial use of Alcoa's alloy 2008, developed to offer formability, strength and weight savings for auto applications.

> With growing emphasis on recyclability, fuel efficiency and safety, auto makers in Germany, Japan and the U.S. are looking to aluminum as an ideal material to provide these benefits. Alcoa is centralizing the planning of the long-range activities of its business units which supply products to the worldwide automotive industry to better serve this growing market.

> Alcoa is continuing to develop new alloys and products for aerospace applications. Boeing is currently evaluating a variety of these advanced products for its new 777 aircraft.



> The modernization of Alcoa's can sheet plants in Warrick, Ind. and Alcoa, Tenn. neared completion, resulting in increased productivity and higher can sheet quality.

> A plastic closure plant opened in Brazil to serve the rapidly growing Latin American market. Capacity was added to serve the U.S. and European markets.

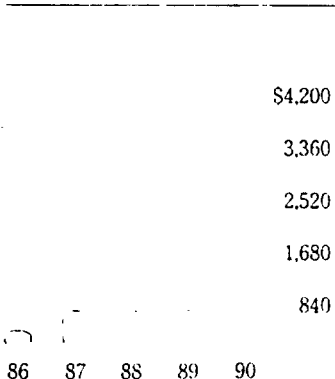
> A new high-strength, formable alloy for use in beverage can tabs was developed by Alcoa Laboratories and Warrick Operations.

> Alcoa shipped 755,000 mt of can sheet, a decrease of 8% from 1989. 21.4 billion aluminum and plastic closures were shipped, an increase of 12% from 1989.

> Alcoa's joint venture with Kobe Steel Ltd., Japan's leading producer of rolled aluminum products, plans to produce and market aluminum sheet for the growing beverage container markets in Japan and other Asian countries.

> Growth opportunities for Alcoa's closure business are being pursued internationally through joint ventures and technology licensing agreements.

> Foil laminate products for microwave food packaging and peelable lids for single serve containers are growing in popularity.



> AFL opened a plant in Mexico to produce components for the instrument panel of Ford Motor Company's 1991 Crown Victoria and Grand Marquis, and opened an engineering and design office in Japan to work with Mazda and other auto makers.

> AFL became the first U.S. electrical distribution systems manufacturer to supply a Japanese auto maker. The 1991 Subaru Legacy uses AFL's product.

> AEP delivered a prototype ceramic package to a major U.S. computer maker.

> ACI acquired Bonded Technology, Inc., a producer of aerospace parts made of bonded composite materials.

> AFL plans to expand its position as a key supplier to the auto and telecommunications industries through continued emphasis on quality while pursuing acquisitions in key markets.

> The sale of ACI's Astech division, which produces titanium honeycomb engine components for aircraft, is expected to be completed in 1991.

> ACI is pursuing a variety of product applications for the transportation market. With Union Pacific Railroad, ACI is developing a fiberglass composites railcar to carry autos and other valuable cargo.

Selected Six-Year Financial Data

(in millions, except share amounts)

	1990	1989	1988	1987	1986	1985
Sales and operating revenues	\$10,710.2	\$10,910.0	\$ 9,795.3	\$7,767.0	\$6,431.4	\$6,599.5
Other income, principally interest	154.9	251.5	140.3	91.8	52.5	82.7
Cost of goods sold and operating expenses	7,606.2	7,338.3	6,527.7	5,456.7	4,753.2	5,038.3
Selling, general administrative and other expenses	592.3	540.8	485.0	445.0	364.6	372.7
Research and development expenses	220.3	182.4	167.4	173.7	148.9	120.3
Provision for depreciation and depletion	689.9	638.3	623.2	587.3	522.9	515.5
Translation and exchange adjustments	(5.4)	1.9	168.1	111.1	61.2	1.6
Interest expense	184.7	178.3	208.4	240.8	274.8	330.5
Taxes on income	393.8	798.4	598.3	214.9	118.9	(32.5)
Other taxes	115.5	115.7	120.7	90.9	82.6	83.2
Special items (income) expense	414.4	—	—	231.3	(138.5)	242.5
Income from operations	653.4	1,367.4	1,036.8	307.1	295.3	10.1
Minority interests	(358.2)	(422.5)	(175.4)	(83.1)	(31.3)	(26.7)
Extraordinary (losses)	—	—	—	(23.9)	(9.9)	—
Net income (loss)	295.2	944.9	861.4	200.1	254.1	(16.6)
Per common share	3.40	10.67	9.74	2.25	2.96	(.23)
Cash dividends declared per common share	3.05	2.72	1.30	1.20	1.20	1.20
Working capital	1,706.3	1,594.9	1,307.9	984.1	839.3	1,326.1
Properties, plants and equipment	6,747.0	6,658.6	6,415.0	6,402.7	6,230.4	6,199.9
Other assets and liabilities, net	349.8	714.9	452.3	542.0	624.9	303.2
Total assets	11,413.2	11,540.6	10,537.5	9,901.9	9,545.1	9,428.9
Long-term debt—noncurrent	1,295.3	1,316.3	1,524.7	2,457.6	2,521.7	3,123.5
Future taxes on income	763.5	852.1	770.1	700.5	660.8	662.5
Minority interests	1,581.0	1,533.1	1,244.9	860.0	790.5	735.3
Shareholders' equity	5,163.3	5,266.9	4,635.5	3,910.7	3,721.6	3,307.9

Export sales from the U.S. were \$926 in 1990, slightly lower than the \$935 in 1989.

The operating profits referred to above differ from net income in that the former do not include interest, income taxes and non-operating income.

Alcoa's operations consist of three segments: Alumina and Chemicals, Aluminum Processing and Non-Aluminum Products.

A discussion of each segment follows. Additional segment and geographic area information can be found in Note R to the financial statements on page 47.

Alumina and Chemicals Segment

This segment's revenues were \$1,842 in 1990 compared with \$1,743 in 1989 and \$1,216 in 1988. Alumina represents about 70% of total revenues in this segment. AA's alumina shipments were up 3% from 1989; revenues were down 3%. These lower revenues were more than offset by increased alumina sales in the U.S. Prices for alumina have drifted downward from the historically high level attained in 1989 when alumina supplies worldwide were very tight.

Chemicals revenues increased 15% from the prior year following a 12% increase in 1989 from 1988. The industrial chemicals markets remained strong through most of 1990, particularly in Europe, but began to weaken near the end of the year.

The alumina refinery at Bauxite, Arkansas



Revenues from alumina and chemicals for 1990 were \$1,842 million, up from \$1,743 million in 1989 and \$1,216 million in 1988.



Strong U.S. demand for rigid container sheet for beverage cans indicates the company is regaining market share lost in 1989 from competitive price discounting.

was closed down in mid-90. This facility will continue to produce alumina chemical. Construction started on AA's 630,000 mt expansion of its Wagerup alumina refinery.

Aluminum Processing Segment

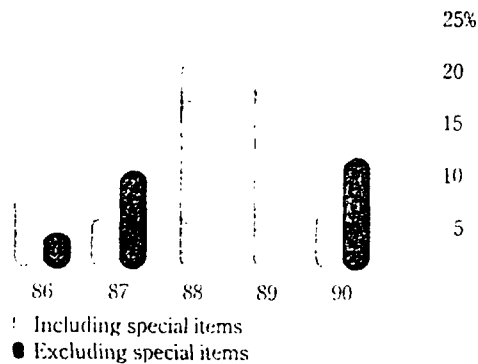
Revenues for the Aluminum Processing segment were derived from the following:

Aluminum Processing Segment	1990	1989	1988
Revenues:			
Packaging Systems	\$2,540	\$2,791	\$2,761
Aerospace and Industrial Products	2,665	2,894	2,811
Metals and Chemicals	2,237	2,280	2,030
Materials Science	36	54	70
Total revenues	\$7,478	\$8,019	\$7,672
Aluminum shipments (000 metric tons)	2,724	2,579	2,504

Although aluminum product shipments increased 6% over the prior year, revenues were down 7%. In 1989 this segment's shipments were 3% higher than those for 1988 while revenues were up 4%.

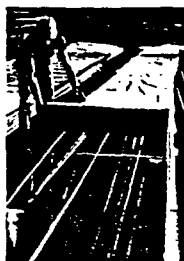
> **Packaging Systems**—Shipments of rigid container sheet (RCS) for beverage cans were down 8% from 1989; revenues declined 12%. Heavy price discounting prevailed in the U.S. late in 1989 and continued through-

Return on Shareholders' Equity



out 1990. However, RCS bookings for 1991 strongly indicate that Alcoa is regaining U.S. market share that it lost in 1989. In Europe, RCS shipments from Alcoa's Swansea operations were up 35% from 1989 and revenues increased 53%. European operations contributed 13% of total RCS revenues in 1990 compared with 7% in 1989. Revenues from aluminum closures were up 9% from 1989, following an 8% increase from 1988 to 1989. These increases reflect higher demand in Europe and the Far East.

> Aerospace and Industrial Products—In 1990 total Aerospace and Industrial Products shipments were down 3% from 1989 while revenues declined 8%. For sheet and plate products, demand in the aerospace market remained strong in 1990 but the U.S. automotive, housing and consumer goods markets remained weak. Sheet and plate shipments were 8% lower than those of a year ago while revenues fell 10%. Reflecting similar economic conditions, shipments of sheet and plate products in 1989 were 16% lower than those for 1988. But higher prices for some products and a higher value-added product mix kept the decrease in revenues to only 2%. For extruded products, prices were lower in 1990 compared with 1989. Although shipments of these products rose by 1%, revenues were off 4%. The European extrusion markets showed improvement,



Despite strong demand in aerospace markets for products like this wing panel, sheet and plate shipments were down 8% and revenues down 10% from 1989.



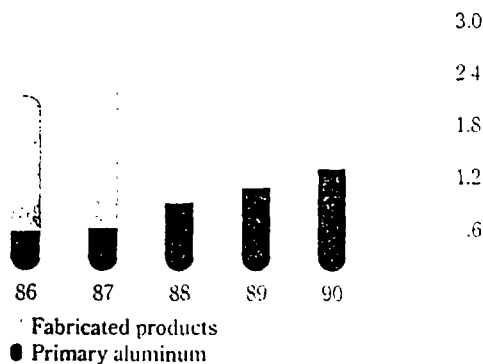
Aluminum ingot shipments increased by 43% of total aluminum product shipments in 1990 compared with 1989.

however, as both shipments and revenues from Alcoa Nederland increased 14% and 16%, respectively. For forged wheels, demand continued to grow: shipments were 22% higher and revenues rose 21%. Revenues from aluminum trim for automobiles and products for the building industry in the U.S. were down from 1989, as well as in 1989 compared with 1988, mainly due to lower volume.

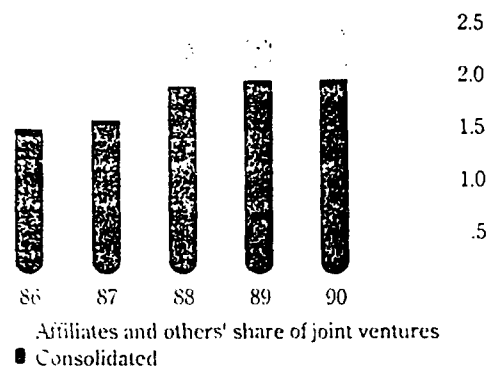
> Metals—Aluminum ingot prices continued to slide in 1990. The average U.S. market price (*Metals Week*) for ingot was \$1.10 per pound in 1988, fell to 88 cents in 1989 and dropped to 74 cents in 1990. In early 1991 this price was in the upper 60s.

Alcoa's average realized price for ingot was 75 cents per pound in 1990 compared with 91 cents in 1989. Total shipments of aluminum ingot reached 1,177,000 mt, an increase of 22% over 1989. Revenues were \$1,940, slightly lower than the \$1,946 in 1989. Ingot shipments from the U.S. system were 15% higher than those for 1989 while revenues increased just over 1%. AA's ingot shipments rose 38% over 1989 but revenues were up only 8%. AA's higher shipments were primarily from the volume of ingot it purchased and resold. Aluminio's domestic

Aluminum Product Shipments
(millions of metric tons)



Primary Aluminum Production
(millions of metric tons)



ingot sales fell sharply from a year ago due to the deepening recession in Brazil. However, the drop in domestic volume was more than offset by higher exports. Overall, Aluminio's ingot shipments were up 13% from 1989 but revenues fell 18%.

Non-Aluminum Products Segment

This segment's revenues were \$1,390 compared with \$1,148 in 1989 and \$903 in 1988. More than half of the increase from 1989 to 1990 is due to full-year revenues of a vinyl and wood building products subsidiary compared with six months of revenues in 1989 when the subsidiary was acquired. Revenues from gold production at AA increased by 43% over 1989 with a 17% increase in production. Subsidiaries that produce purification systems had a 24% decline in revenues due to weak demand. The subsidiary that produces electrical distribution systems for autos had a 3% drop in revenues due to the slowdown in the U.S. automotive market. Alcoa Electronic Packaging (AEP) had operating costs of \$73 in 1990 and \$35 in 1989 as it continued to invest in the development of the ceramic packaging business. AEP expects to ship its first commercially competitive material to two major customers in the first half of 1991. An important decision point will be reached in 1991 relative to future investments in AEP.



Depressed U.S. housing and auto markets eroded demand for such products as residential siding and auto trim.



In 1990, Alcoa recycled 315,000 metric tons of used aluminum beverage cans, which are a significant source of metal for rigid container sheet.

Cost of Goods Sold

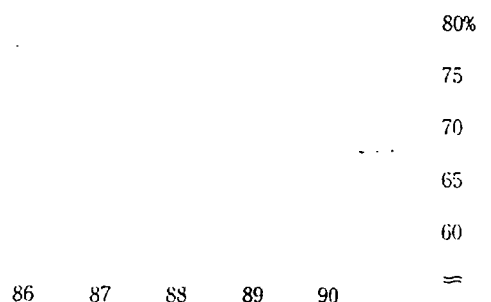
Cost of goods sold of \$7,606 in 1990 was 4% higher than in 1989. Several factors contributed to the increase of \$268, including higher volume in 1990. Additionally, 1990's production costs reflect a full year for the acquired building products subsidiary compared with half of a year in 1989. Higher alumina and labor costs were partially offset by lower purchased metal costs, lower production costs due to a change in mix, and higher utilization. Aluminio's increased production costs reflected lower utilization because of the depressed markets in Brazil.

Included in cost of goods sold in 1989 was \$35 for eligible U.S. hourly and salaried employees under a profit sharing program. In 1990, the Board of Directors authorized a bonus payment totaling \$10 for some 23,000 eligible employees in recognition of the significant earnings for the year.

Other Income and Expense Items

Other income in 1990 was \$97 lower than in 1989. Equity earnings from Alcoa's Norwegian smelting partnership and Mexican operations dropped \$34. Income from interest and short-term investments was \$32 lower. Gains in 1989 and losses in 1990 on sales of capital assets also affected the change in other income. Other income in 1989 was

Cost of Goods Sold as a Percent of Sales



\$111 higher than in 1988 due primarily to interest on short-term investments by AA and Aluminio.

Selling, general administrative and other expenses in 1990 rose nearly 10% from the 1989 level. More than half of the increase is from subsidiaries acquired since mid-1989. Professional fees, travel and benefits were among the other expenses that rose in 1990.

Research and development expenses rose 21% over 1989. Most of the increase related to preproduction and qualification activity at Alcoa's ceramic products subsidiary. Spending in 1990 also focused on programs related to upgrading products and processes such as castings technology, the aluminum intensive vehicle and composites.

Depreciation expense was up \$52 from 1989, reflecting new subsidiaries and the amortization of Alcoa's fabricated products modernization programs that were placed in service during 1990.

The aftertax effect of translation and exchanges gains (losses) included in Alcoa's net income, after allocation to minority interests, follows.

	1990	1989	1988
Alcoa Aluminio	\$ 5.1	\$(22.7)	\$(35.6)
Alcoa of Australia	2.0	19.5	(48.6)
Other:			
Consolidated	(7.5)	(4.8)	(4.2)
Equity companies	(7.6)	(.9)	1.4
Effect on net income	\$(8.0)	\$ (8.9)	\$(57.0)



Reduction in aluminum cost in 1990 helped Alcoa's new technology castings cut costs and improve quality.



Hurt by a major recession in Brazil, earnings of Alcoa Aluminio fell from a record \$176 million in 1989 to just above one million in 1990.

Interest expense, which dropped an average 13% annually over the past several years, rose nearly 4% from 1989. The major reason was higher short-term borrowings by Aluminio to cover its operating needs.

The effective tax rate for 1990 was 37.6% compared with 36.9% for 1989. The difference between these rates and the U.S. statutory rate of 34% is mainly due to higher taxes on income from outside the U.S.

The table below shows total income and operating taxes accrued by Alcoa.

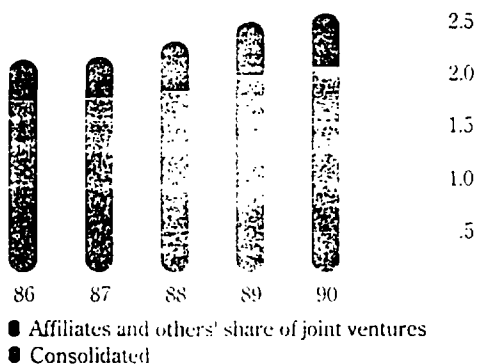
	1990	1989	1988
Taxes on income	\$383.8	\$ 798.4	\$595.3
Payroll taxes	171.9	157.5	140.1
Property taxes	48.3	47.7	41.1
Other	67.2	73.4	88.1
	<u>\$671.2</u>	<u>\$1,077.0</u>	<u>\$867.6</u>

Minority Interests

A portion of consolidated income from operations is attributable to shareholders that have up to a 50% ownership interest in some Alcoa subsidiaries. These shareholders are collectively referred to as "minority interests." Income from operations attributed to minority interests in 1990 was \$64 less than in 1989, due primarily to Aluminio's significantly lower earnings.

Primary Aluminum Capacity

(millions of metric tons)



Liquidity and Capital Resources

Cash from Operations

Cash from operations was \$1,587 in 1990 compared with \$1,971 in 1989. The difference was mostly due to a lower level of income in 1990. Cash and short-term investments at year-end 1990 were \$636, of which \$408 was held by AA and Aluminio. At year-end 1989, cash and short-term investments were \$805.

The dollar value of inventories increased by \$104 in 1990, reflecting higher costs for materials and labor. Aluminum inventory tonnages at the end of 1990 and 1989 were at virtually the same level.

Financing Activities

Financing activities during 1990 required cash outlays totaling \$932 versus \$827 in 1989. In 1990 Alcoa bought back 2,861,700 shares of its common stock as part of a plan to repurchase ten million shares. The cost to repurchase these shares was \$182. In 1989 repurchases of 1,393,000 shares cost \$101. Alcoa also bought back and retired 102,140 shares of preferred stock in 1990.

Dividends paid to shareholders reached \$267 in 1990, which included a profit sharing dividend, based on 1989 earnings, of \$122 (\$1.40 per share). A five cent per share payment was also made in 1990 to redeem



This hot crowd is part of the next year's capital program, construction of new plants to increase capacity in the U.S. and abroad.



This hot crowd is part of the next year's capital program, construction of new plants to increase capacity in the U.S. and abroad.

all outstanding shareholder rights. In 1989 dividends were \$243, of which \$99 (\$1.12 per share) was profit sharing for 1988.

In February 1991 shareholders received a profit sharing dividend of 18 cents per share, based on 1990's earnings adjusted to exclude the special charge.

Dividends paid to minority interests in 1990 and 1989 were \$300 and \$217, respectively. Alcoa received dividends of \$235 in 1990 and \$162 in 1989 from AA, and \$48 and \$107 from Aluminio in the respective periods.

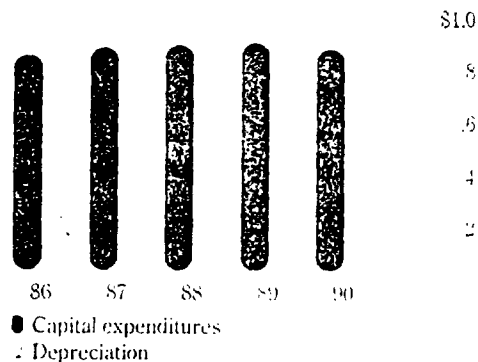
In 1990 long-term debt payments exceeded borrowings by \$169. In 1989 and 1988 there were also net reductions of \$119 and \$849, respectively. At year-end 1990 and 1989 debt as a percent of invested capital was 16%, compared with 21% at the end of 1988.

Investing Activities

Capital expenditures in 1990 were \$851 compared with \$876 in 1989 and \$866 in 1988. About 16% of 1990's expenditures was related to the flat-rolled products modernization programs which are now complete. The remaining capital expenditures related to a variety of projects aimed to reduce costs, improve efficiency and maintain or increase capacity.

Capital Expenditures and Depreciation Expense

(in billions)



Environmental Matters

Compliance with increasingly stringent environmental laws and regulations has resulted in higher expenditures, including costs for cleanup of company locations and superfund and other waste sites.

In December 1990 Alcoa's provision for environmental liabilities was increased by \$136.4. Alcoa records a liability for environmental remediation costs when a cleanup program becomes probable and the costs can be reasonably estimated.

Management is unable to predict the possible future effect that environmental laws, regulations and litigation may have on operations or earnings because of the many uncertainties associated with the various environmental issues.

Other Developments

A five-year multiple option loan facility was increased from \$500 to \$753 in early 1990. Under the agreement, banks will make advances to Alcoa in U.S. dollars or other currencies. The agreement stipulates that while advances are outstanding, debt cannot exceed 150% of net worth, the current ratio cannot be less than 1 to 1, and a minimum working capital of \$500 must be maintained. This revolving facility was not used in 1990.

In late 1990 Alcoa and Kobe Steel agreed to form a 50-50 joint venture, KSL Alcoa Aluminum Company, that will produce and market aluminum sheet primarily for the growing beverage container markets in



Alcoa and Kobe Steel agreed to form a joint venture to produce and market aluminum sheet for the growing beverage container markets in the Far East.



Alcoa and Kobe Steel agreed to form a joint venture to produce and market aluminum sheet for the growing beverage container markets in the Far East.

Japan and other Asian countries. A new plant, which will have a cold-rolling line, will be built in Japan, with production scheduled to begin in 1993. The partners will also study opportunities for developing aluminum products for the automotive market.

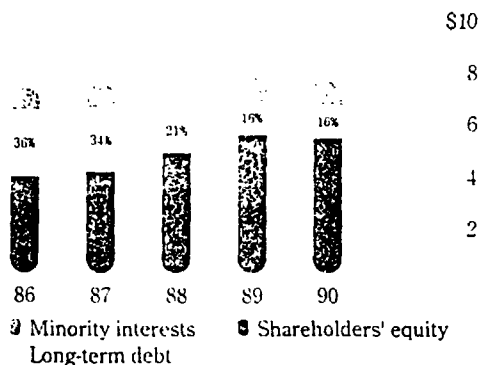
An accounting standard on income taxes was issued in 1987 and must be implemented by 1992. Management estimates that the company's financial position would have been nominally affected if the standard had been in effect as of the end of 1990.

An accounting standard for postretirement benefits was issued in late 1990 and must be implemented by 1993. Under the new rules, Alcoa's estimated retiree medical and life insurance costs will have to be accrued ratably from the date of hire until the employee is eligible to receive the benefits, rather than as these costs are incurred. Cash flows will not be affected.

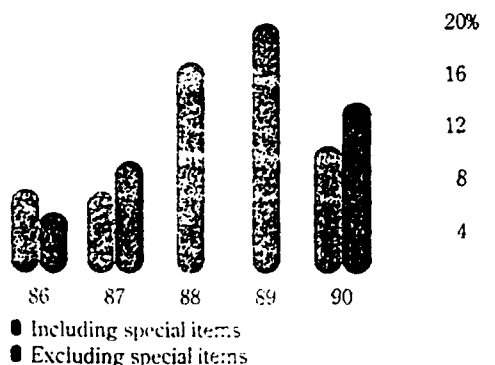
Companies have an option to either record the liability for unaccrued postretirement costs for retirees eligible to receive benefits in one lump sum or amortize it over a specified period. There also will be a substantial increase in the annual amount of benefits charged to expense. The amounts, method or timing cannot be determined until a review of the standard is completed. Preliminary estimates indicate that the lump sum value of the liability is likely to be on the order of \$1 billion.

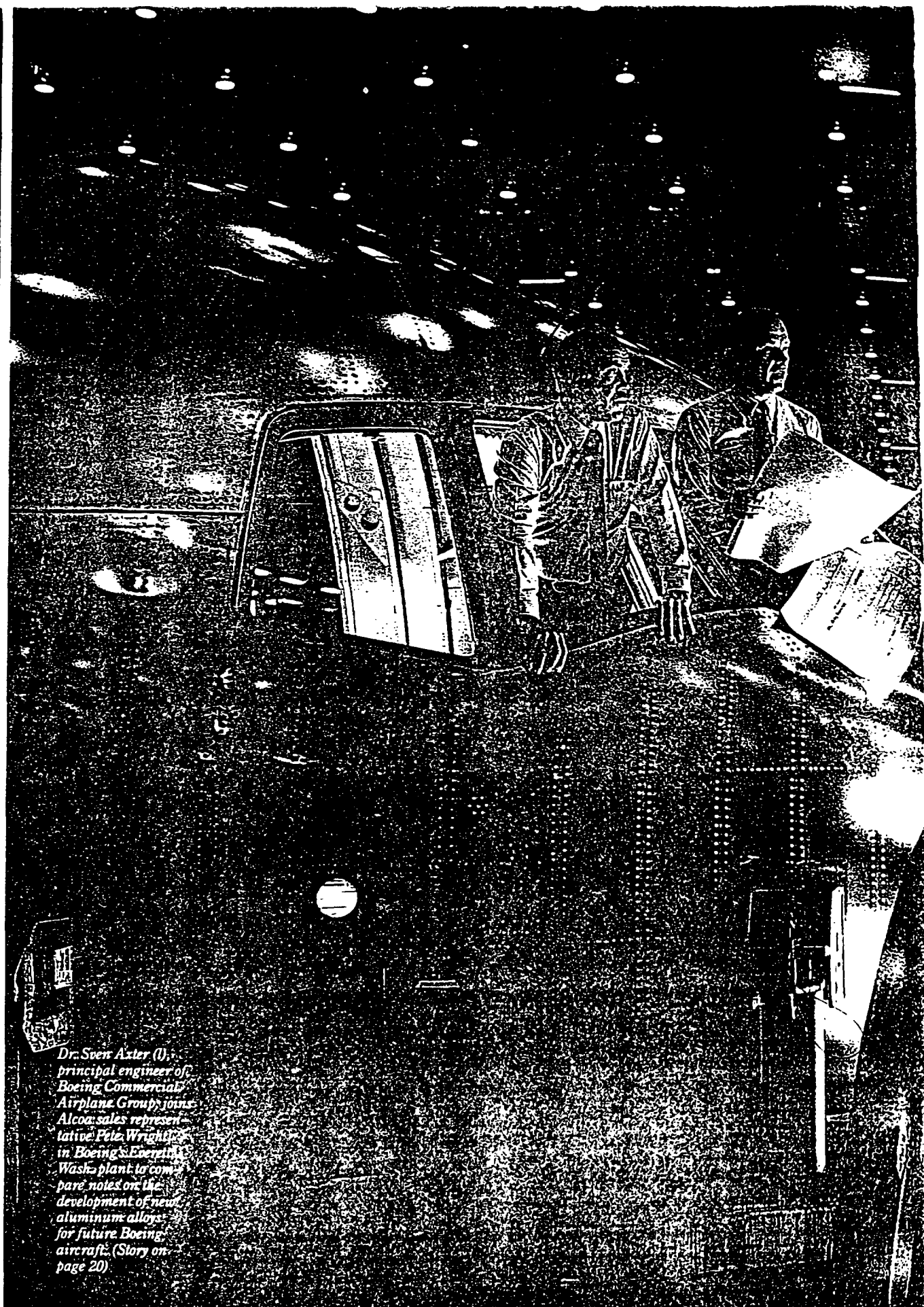
Components of Invested Capital

(in billions)



Return on Invested Capital





Dr. Sven Axter (l), principal engineer of Boeing Commercial Airplane Group, joins Alcoa sales representative Pete Wright in Boeing's Everett Wash. plant to compare notes on the development of new aluminum alloys for future Boeing aircraft. (Story on page 20)

Boeing New Alloys for the 777

Cooperation between Alcoa and its aerospace customers has often spearheaded the development of new aerospace materials.

The latest advance in alloy development will enhance the performance of the Boeing 777 twin jet scheduled to roll out in 1994. And this time, an innovative method of sharing technical data will assure the consistency of the new materials from shipment to shipment, as long as they're in use.

The 777 is a new wide-body long-range commercial transport with new wing technology. For the upper wing, Alcoans at Davenport (Iowa) Works and Lafayette (Ind.) Works have made prototype parts from a new aluminum alloy developed at the Alcoa Technical Center.

As the plane moves into production and through certification, the critical challenge is to make certain these materials do not vary at any time from the original design specifications. The solution: track the production processes at Davenport and Lafayette with statistical process controls (SPC) and make the SPC approach an integral part of the material specification requirements set by the customer.

Alcoans will run SPC charts on up to nine critical processing steps plus five alloying elements. Four key properties of the material will be charted as well.

This advanced use of statistical tools will enable Alcoa and its aerospace customers to insure product consistency over time.

Alcoa's latest partnering effort with Boeing takes advantage of advanced statistical tools to maintain precise, consistent characteristics of a new aluminum alloy developed for use in the Boeing 777.

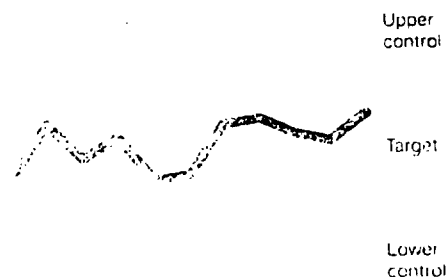
On facing page, Joel Bower (b) and John Campbell check statistical process control (SPC) charts they're using at

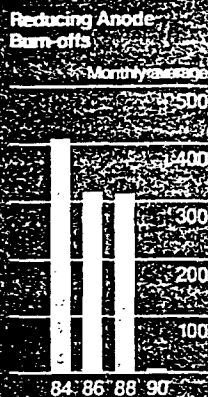
Davenport (Iowa) Works to track key steps in processing aluminum for Boeing.

With a scale model of the new 777, below, Alcoa's Pete Wright (l) and Boeing's Sven Axter compare the latest SPC data with those from earlier shipments, verifying uniformity of the material over time, as shown in the accompanying chart.



Monitoring Silicon Content in Aerospace Alloys





The Internal Customer

In the smelting plants at Massena (N.Y.) Operations, the Rodding Department's product is a rodded anode—a carbon block anode joined to a rod by a cast iron electrical connection.

In the Potroom, these rodded anodes are lowered into electrolytic cells to replace anodes which have been consumed in the smelting of aluminum.

Alcans from the Housing Department and the Portland Fire formed a quality team in 1988, determined to solve the problem.

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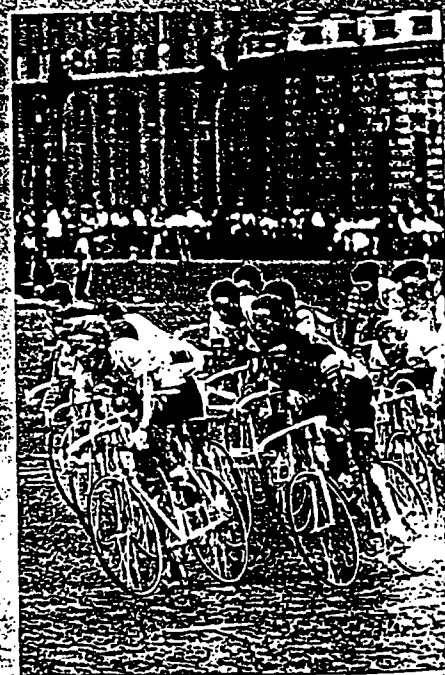
the 1980s, the 1990s, and the 2000s. The article discusses the impact of the 1980s on the 1990s and the 1990s on the 2000s. It also discusses the impact of the 2000s on the 1990s and the 1990s on the 1980s. The article concludes that the 1980s, the 1990s, and the 2000s are all part of a larger, continuous process of change and development.

1. The first part of the document is a letter from the author to the reader, dated 1911. It discusses the author's interest in the history of the United States and the role of the government in the development of the country. The author mentions that he has been studying the history of the United States for many years and has found that the government has played a significant role in the development of the country. He also mentions that he has been studying the history of the United States and has found that the government has played a significant role in the development of the country.

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extrude complicated wheel sections within tolerances down to a hundredths of a millimeter, while maintaining strict consistency in metal hardness, tensile strength and elongation. Other gains soon followed: production efficiencies at both plants, new rim shapes, lower weights and improved strength-to-weight ratios.

These successes have given Alcoa a lead in aluminum wheels and Alcoa a 50% share in a growing market.



Shell Securing the Seal

Marketing motor oil in easy-opening one-quart plastic bottles, Shell Oil Company wanted to give consumers the benefit of a more tamper-evident package.

The bottles are made by Sonoco Graham, and Alcoa's H-C Industries molds Uni-Lok closures to seal them. At Shell's suggestion, Alcoa and Sonoco Graham joined in a three-way quality partnership to improve the package. In addition to tamper evidence, the team focused on the consistency of seal security—preventing “leakers”—and ease of opening, which tended to vary.

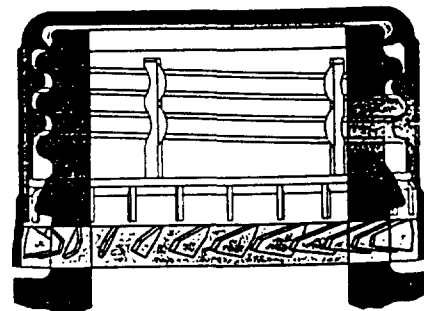
Team members decided to take on the challenge of optimizing the entire package. H-C engineers developed a more uniform compression molded closure with an in-shell molded liner. Sonoco Graham design engineers reconfigured the bottle finish for a precise match to the new closure, and team members from both companies worked out the details that made the tamper-evident band work with the new bottle.

In test runs, the new package proved to be 99% tamper-evident. Seals are consistently secure, and closures are uniformly easy to open. Shell decided to move 100% of production to the new package design.

For all concerned, the partnership added value for customers, and now other oil companies are expressing interest in the new package design. Total U.S. market: 1.8 billion bottles a year.

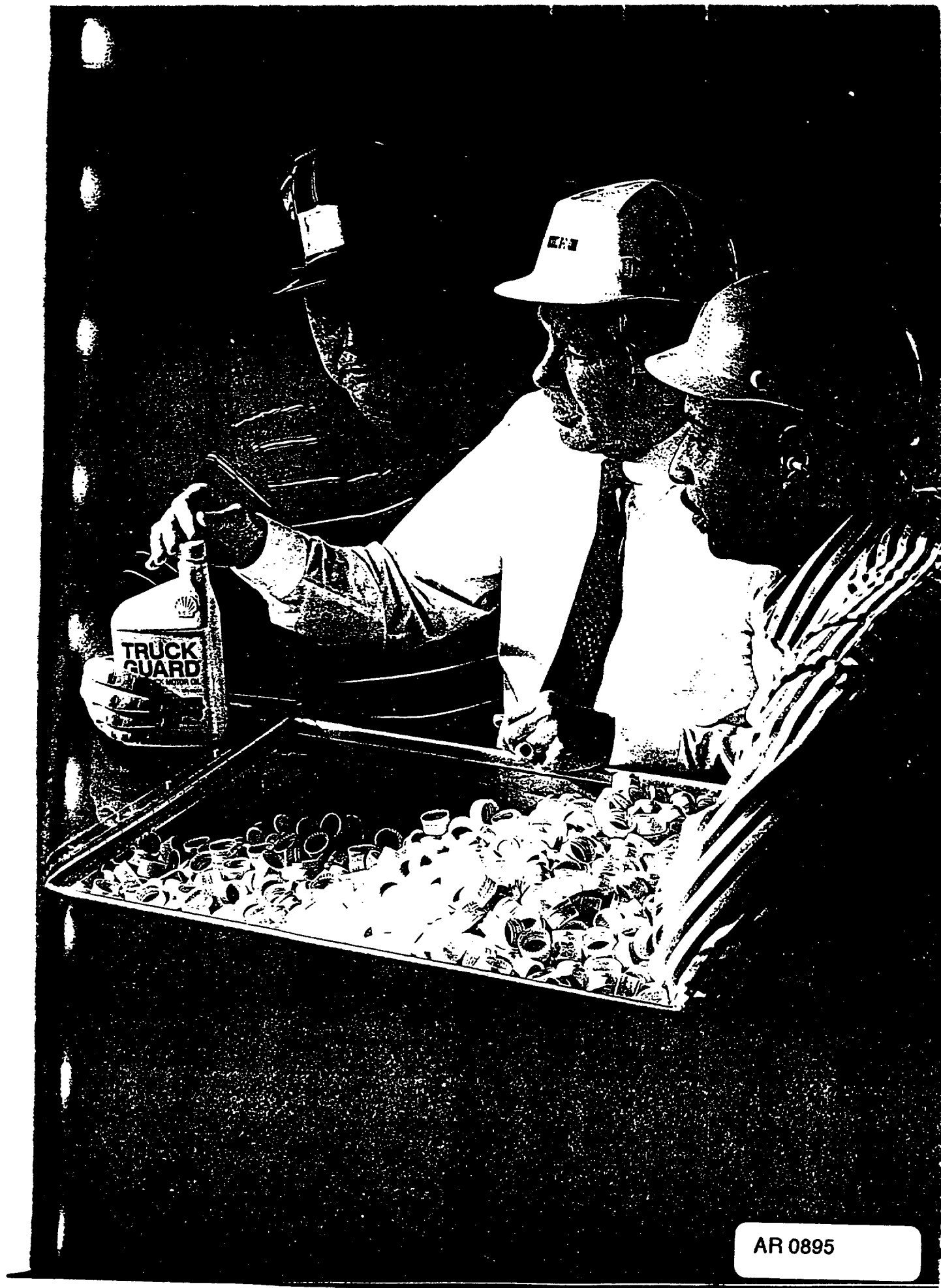
Shell Oil Company packs millions of quarts of motor oil a year in plastic bottles made by Sonoco Graham with tamper-evident closures from Alcoa's H-C Industries. In a three-way quality partnership, packaging and production specialists from Shell, Sonoco Graham and Alcoa modified the closure, the bottle

thread design and the tamper-evident band (see the cross-section diagram below). At right, Sonoco Graham's John Litton (l) checks a successful test run of the new package with Lec Albrecht of H-C Industries and Anthony Bridges (r) of Shell.



■ Liner ■ Bottle
■ Closure ■ Tamper-evident band

AR 0894



AR 0895

Partnering on Wings

"Stringers" are key structural members for aircraft wings, extending from the fuselage to the wing tips to support the wing skins.

Working with McDonnell Douglas Canada (MDCAN), Alcoa's in the Extrusion/Tube Division (Alco) Lafayette (Ind.)

Works extrude high-strength aluminum alloy to make stringers for the MD-80 twin jet and the new MD-117 jet whose wing span is nearly 70 feet.

Alco's extrusion process produces stringers that are lighter and stronger than those made by other methods.

Objective: A 30% reduction in total costs.

Already, the team has found ways to simplify machining



Examining an MD-11 wing are Jim Gale (l) of Alcoa and Sandy Tosh (r) of MDCAN. They're part

of a joint quality team working to analyze and improve every step of production. An important goal is to reduce the cost of the 30% production in total costs.

Already, the team has found ways to simplify machining

and other processes at MDCAN and reduce rework and straightening operations at Lafayette. Flow time has improved; inventory costs are down, and MDCAN just signed a long-term supply agreement with Alcoa Lafayette.



A Fruitful Partnership

Tropicana insists on tamper-evident packaging for their juice and juice beverage products to ensure good shelf life and product purity.

Toward these goals, they developed an innovative method to fill and cap their bottles aseptically.

Problem: how to apply closures at high speeds in a high-temperature steam environment.

Tropicana engineers joined with the packaging technologists at Alcoa's Richmond (Ind.) Works and

worked out modifications in the process and closure to make the application work well at high speeds.

Except that the high-steam environment caused frequent stoppages to lubricate.

To solve that, Alcoa engineers devised a wick-lubricated bearing that keeps the line running for eight hours at a time—adding roughly 100,000 cases a year to production.



AR 0898

Komatsu Partnering with Alcoa's Suppliers

Alcoa's partnerships with customers have a mirror image. When our role is that of customer rather than supplier, it's no less important to have quality-driven partnerships to raise the value of what we buy.

At the Huntly mine near Booragoon, Western Australia, Alcoa of Australia had been using four giant Komatsu Mark I 85-metric ton (mt) dump trucks since 1984 to haul bauxite ore from the minesite to the alumina refinery.

Komatsu factory, service and senior management personnel regularly visit the minesite to check on customer satisfaction. In 1987, as Huntly prepared for a conversion from 16-hour to 24-hour operations, regular discussions were begun to identify needs and opportunities in hauling and loading. This joint effort singled out four priorities: safety, operator comfort, haul speed and the service life of differential, transmission and brake systems.

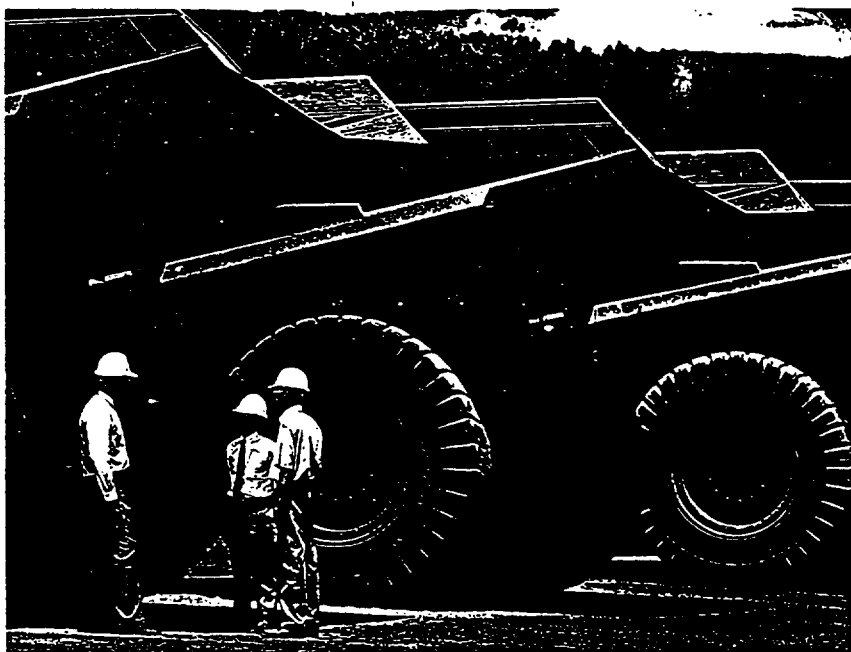
Komatsu used this analysis to design the 1989 Mark III truck to meet Alcoa targets. During a six-month minesite trial of the first Mark III truck, Komatsu factory engineers came to Huntly to participate in on-site training programs.

Results: 1990 trucking and loading costs per mt were 8% lower than in 1988, despite two years of inflation. Total tonnage hauled was up 69% with fewer vehicles, even though average hauling distance had increased from 2.5 to 3.9 km.

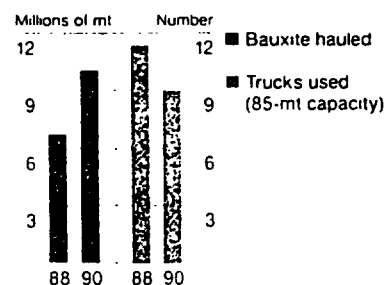
And, most important of all, trucking and loading safety errors and injuries were down 50%.

Loaded with 85 metric tons of bauxite ore from Alcoa of Australia's Huntly mine, a Komatsu Mark III dump truck (facing page) heads for the crusher, where the ore will be processed for the Pinjarra refinery. In a quality partnership with Australian Alcoans, Komatsu engineers designed the Mark III to meet

Alcoa targets for safety, productivity and service life. Here, Rex Baker (l) and Peter Burgess (r) of Alcoa discuss operator training programs with Ted Takiguchi of Komatsu. As the chart shows, the partnership succeeded in boosting the tonnage hauled while decreasing the fleet.



Increasing Hauling Efficiency



Smelters

Doubling the Life of a Smelting Pot

The heart of a smelting plant is the potroom, where aluminum oxide (alumina) is reduced in electrolytic cells called "pots," yielding aluminum metal.

How long can a pot go on working? World-class performance is over seven years, but some potrooms average less than four. And the difference affects costs and efficiency for the entire series of internal customers who depend on this source of metal.

In a quality partnership to lengthen pot life, Alcoans from the company's U.S. smelting locations have zeroed in on the causes of pot failures.

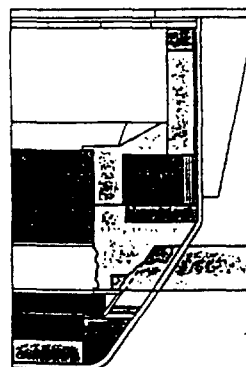
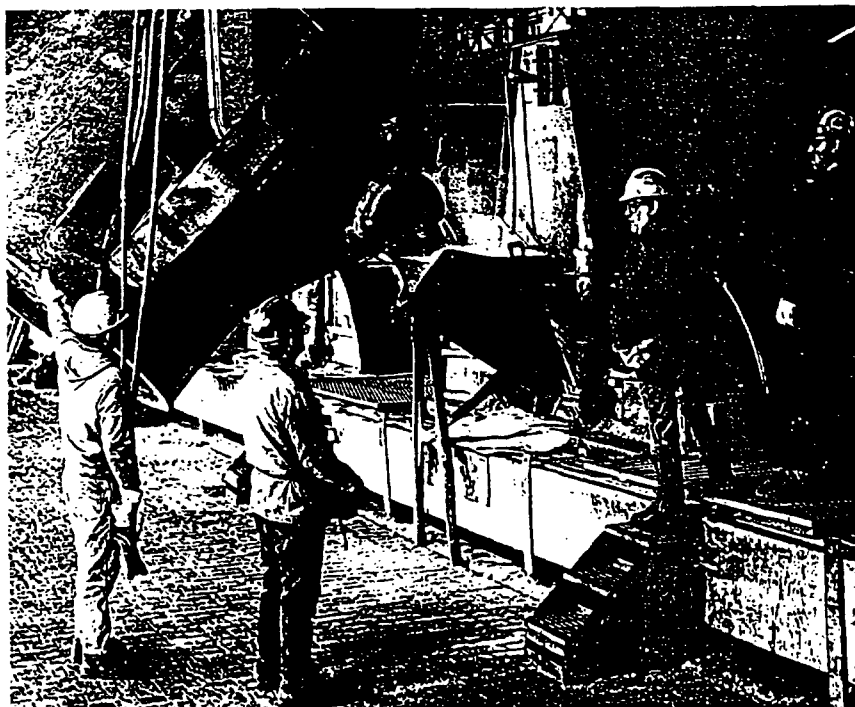
The team's first target was improving the quality of new pot start-ups because roughly 50% of a pot's ability to achieve full service life is determined by the initial curing process known as bake-in and by new pot operating procedures. Another 20% is due to the way the lining of the cell is installed by the pot repair group.

With help from Alcoa Technical Center in setting up testing facilities, the team has worked to identify optimum start-up practices—baking energy, soaking temperature, initial operating temperature and other variables—and to standardize these practices at all smelters.

The project is ongoing, but progress is already evident. Pots lined in the first half of 1987 showed a 20% failure rate in their first 600 days of operation. For pots lined in the second half of 1988, this early-failure rate is down to zero.

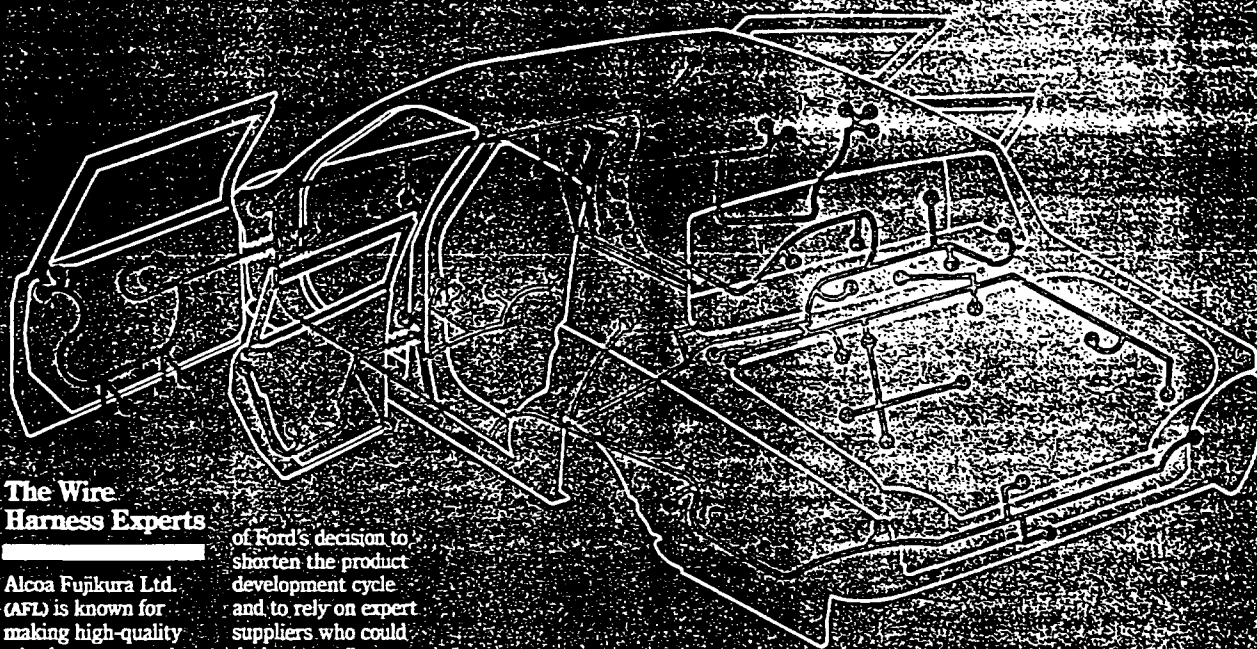
These are a few of the Alcoans who formed a quality partnership involving all of Alcoa's U.S. smelters in an effort to lengthen the service life of smelting pots. Below, on a potline at Massena (N.Y.) Operations, Mike Dishaw (l), Al Kellison, Bruce LaDue and Tommy Oakes (r) add a molten bath to a new pot as part of the start-up procedure.

At right, pot repairers Phil Ross (l) and Al Miller carefully level and tamp the castable mix for a new pot. The partial cross section of a pot shown in the diagram on this page indicates the complexity of what they're dealing with: more than 200 "building blocks" that go together to make up a smelting pot.





AR 0901



The Wire Harness Experts

Alcoa Fujikura Ltd. (AFL) is known for making high-quality wire harnesses—the electrical distribution systems for cars and trucks.

Now, Ford Motor Company has given AFL a chance to serve as architects as well as builders—taking on the design responsibility for wire harnesses to equip Ford's successor to the Crown Victoria/Grand Marquis line. This partnership grew out

of Ford's decision to shorten the product development cycle and to rely on expert suppliers who could design as well as manufacture a component.

AFL's experts responded by resolving engineering, quality and feasibility issues well in advance of production. As a result, they avoided most of the time-consuming, expensive changes and modifications that most start-up runs experience.

The Quality-Driven Driveshaft

Aluminum driveshafts for the Corvette and other General Motors vehicles are made by Dana Corporation, using alloy tubing from Alcoa's Lafayette (Ind.) Works. The critical quality issue is fatigue life, which in turn depends on precise tolerances and fit of the shaft with its ball yoke.



Watching Dana employees balance, rebalance, inspect, fit and refit each shaft to assure this precision, Alcoa salesman Steve Cramer (l) talked to Dana's Bob Stanley about forming a joint quality team. Couldn't many of these steps be saved,

he asked, if the tubing were made to more precise tolerances in the first place?

The team worked to reconcile specifications and measuring techniques, then targeted other key quality and cost factors. Results: with assured quality of tubing from Lafayette, Dana has been

able to simplify balance and fit operations and actually improve fatigue life of the final product. And both companies are saving money.

AR 0902



A 24-Hour Turnaround

Customers of Alcoa Aluminions Brazil value prompt service on a host of industrial products from the Mangueira distribution branch in Rio de Janeiro. But space is at a premium. Workers who sort, pack and load sometimes had to wait for each other. Mangueira Alcoans rearranged schedules starting their first night shift, to sort and pack each day's orders by dawn of the next day. Response time dropped from 72 hours to 24, and delivery capacity has doubled.



Consistent Coke

At Alcoa's smelters, carbon anodes are made from calcined petroleum coke, and consistent quality in the coke helps to improve anode quality and smelting control. To pursue this goal, Alcoans from Pittsburgh Procurement and from the smelters in Tennessee, Texas and Indiana formed

a joint quality task force with coke supplier Great Lakes Carbon. In two years of intensive teamwork, they've determined which coke properties are most important to Alcoa's processes and have significantly reduced the variability of these crucial factors. The partnership continues to produce measurable improvements.

Warrick Teams Up with Coors

On one production

line at Coors Con-

crete, Colin Cohen,

Colo., 10090, Al-

metal, has been

comes from Al-

Warrick's full-time

Representing

performance of the

customer, Warrick

Alcoans determined

that's why the qual-

ity problems were

related to surface

conditions.

Warrick's Gary

Lucy O) and other

Alcoans organized a

Surface Quality Team

With feedback from

Coors production line

personnel like Dave

Anderson they traced

the problems to input

handling and storage

and addressed these

with innovative design

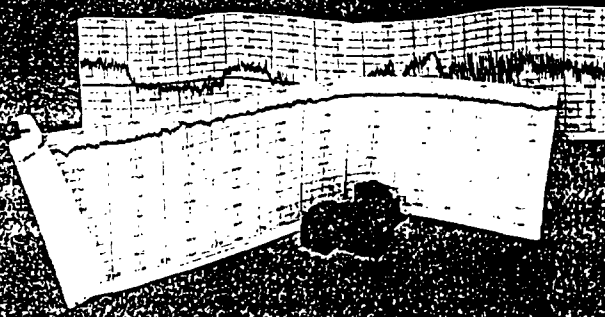
changes. Surface

quality has improved

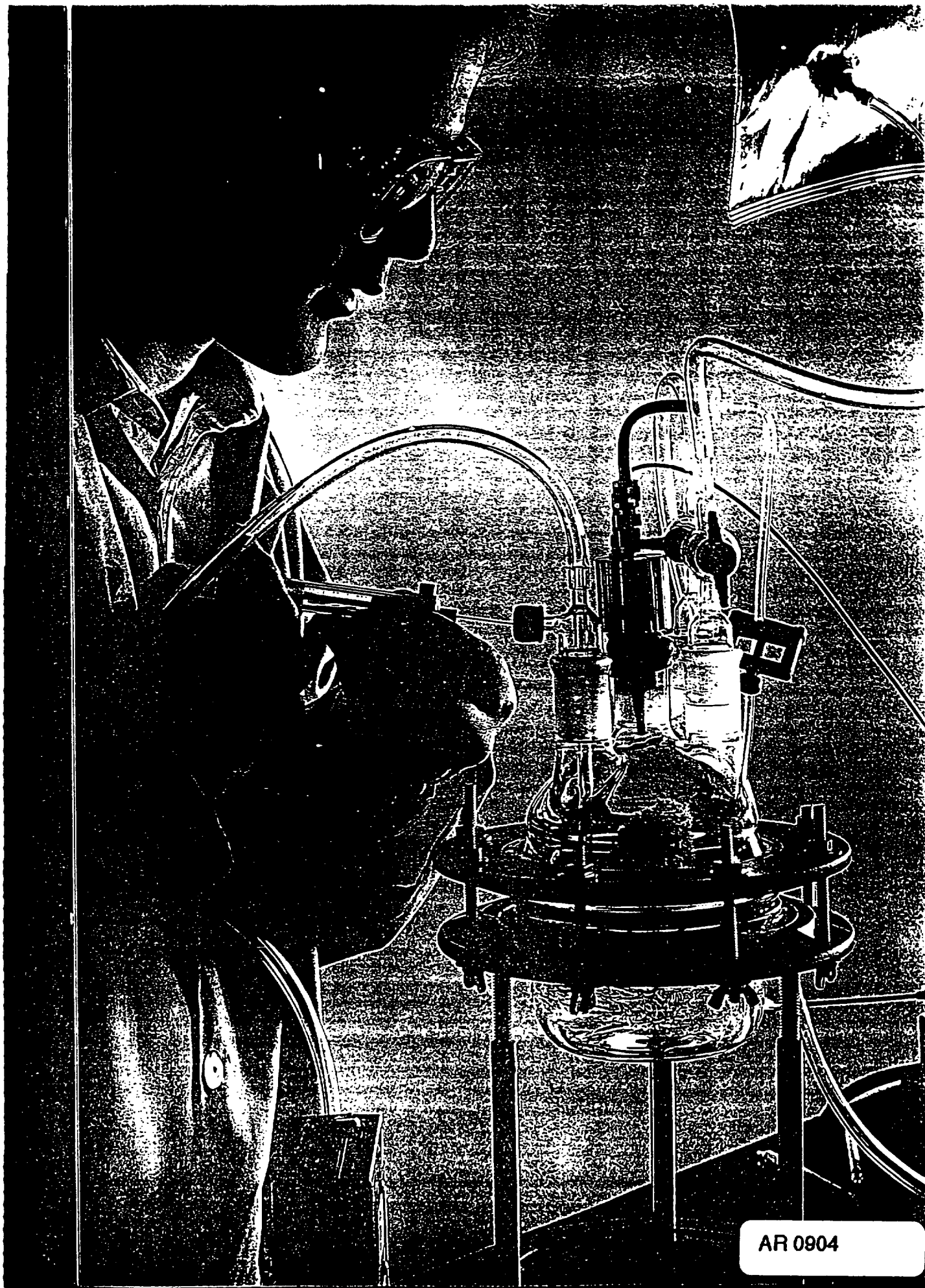
and the partnership is

expanding to include a

second production line



AR 0903



AR 0904

Environment The Ultimate Customer

Throughout Alcoa's operations worldwide, the ultimate customers are the people in every community where we have an impact. Here are some of the ways in which Alcoa tries to meet the needs of its environmental constituents:

Prevention. Alcoa's Early Environmental Involvement Program anticipates and addresses environmental impacts of new products and processes while they're still under development.

Reduction. By recycling 126 billion cans in the U.S. in the 1980s, Alcoa reduced litter and solid waste, lessened the need for new mines, refineries and smelters, and saved the energy needed to run them. What works for cans should eventually work for cars, appliances, other products and their packaging.

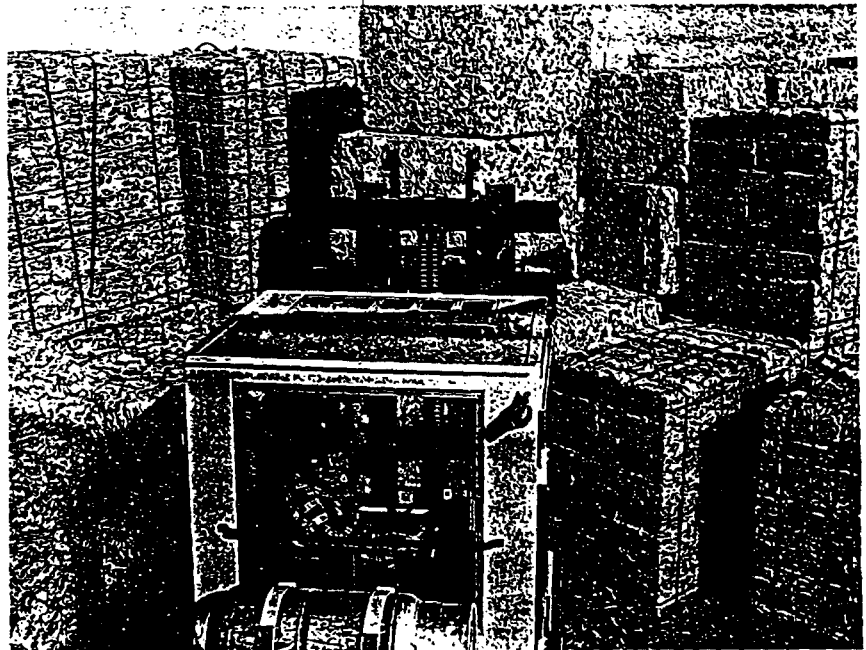
Reclamation. Alcoans around the world pursue a serious, company-wide commitment to protect the environment. Case in point: Alcoa of Australia, with three bauxite mining areas in a Jarrah forest region southeast of Perth, has been honored by the United Nations Environmental Programme for a reforestation program that returns mined areas to timber, clean water and wildlife (photo, next page).

An Environmental Material. Aluminum has been called "the green metal." Aluminum products typically save weight and conserve energy in shipping, handling and everyday use. Aluminum is a superbly efficient conductor of electricity and heat. And it's the only material that pays its way through the recycling loop (see chart).

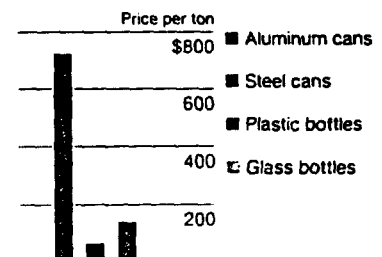
When it's all said and done, Alcoa believes that aluminum will be seen not as part of the problem but as part of the solution.

Environmental efforts, before and after the fact: In Alcoa's Environmental Technology Center, Brian Breisinger runs a series of tests on waste materials from a proposed manufacturing process—part of an Early Environmental Involvement Program to identify and deal with environmental issues before they

become problems. Below, at Warrick (Ind.) Operations, Randy Tuley takes a bale of used beverage cans to be recycled, making new aluminum with only 5% of the energy required to produce the same metal from bauxite. On the next page is an example of environmental rehabilitation in regions where bauxite is mined.



Value of
Recyclables

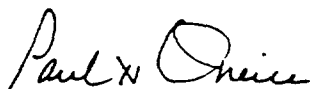


Management's Report to Alcoa Shareholders

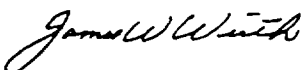
The accompanying financial statements of Alcoa and consolidated subsidiaries were prepared by management, which is responsible for their integrity and objectivity. The statements were prepared in accordance with generally accepted accounting principles and include amounts that are based on management's best judgments and estimates. The other financial information included in this annual report is consistent with that in the financial statements.

The company maintains a system of internal controls, including accounting controls, and a strong program of internal auditing. The system of controls provides for appropriate procedures that are consistent with high standards of accounting and administration. The company believes that its system of internal controls provides reasonable assurance that assets are safeguarded against losses from unauthorized use or disposition and that financial records are reliable for use in preparing financial statements.

Management also recognizes its responsibility for conducting the company's affairs according to the highest standards of personal and corporate conduct. This responsibility is characterized and reflected in key policy statements issued from time to time regarding, among other things, conduct of its business activities within the laws of the host countries in which the company operates and potentially conflicting outside business interests of its employees. The company maintains a systematic program to assess compliance with these policies.



Paul H. O'Neill
Chairman of the Board
and Chief Executive Officer



James W. Wirth
Senior Vice President-Finance

Audit Committee Report

The Audit Committee of the Board of Directors, which is composed of four independent directors, met four times in 1990.

The Audit Committee oversees Alcoa's financial reporting process on behalf of the Board of Directors. In fulfilling its responsibility, the committee recommended to the board the reappointment of Coopers & Lybrand as the company's independent public accountants. The Audit Committee reviewed with the internal auditors and the independent accountants the overall scope and specific plans for their respective audits. The committee reviewed with management Alcoa's annual and quarterly reporting process, and the adequacy of the company's internal controls. Without management present, the committee met separately with the internal auditors and independent accountants to review the results of their examinations, their evaluations of the company's internal controls, and the overall quality of Alcoa's financial reporting.



Franklin A. Thomas, Chairman
Audit Committee

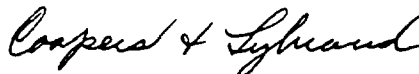
Independent Auditor's Report

To the Shareholders and
Board of Directors
Aluminum Company of America (Alcoa)

We have audited the accompanying consolidated balance sheets of Alcoa as of December 31, 1990 and 1989, and the related statements of consolidated income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 1990. These financial statements are the responsibility of Alcoa's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Alcoa at December 31, 1990 and 1989, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 1990 in conformity with generally accepted accounting principles.



600 Grant St.
Pittsburgh, Pa.
January 18, 1991

AR 0908

Statement of Consolidated Income

(in millions, except share amounts)

Alcoa and subsidiaries

For the year ended December 31	1990	1989	1988
Revenues			
Sales and operating revenues (R)	\$ 10,710.2	\$ 10,910.0	\$ 9,795.3
Other income, principally interest	154.9	251.5	140.3
	<u>10,865.1</u>	<u>11,161.5</u>	<u>9,935.6</u>
Costs and Expenses			
Cost of goods sold and operating expenses	7,606.2	7,338.3	6,527.7
Selling, general administrative and other expenses	592.3	540.8	485.0
Research and development expenses	220.3	182.4	167.4
Provision for depreciation, depletion and amortization	689.9	638.3	623.2
Translation and exchange adjustments	(5.4)	1.9	168.1
Interest expense (L)	184.7	178.3	208.4
Taxes other than payroll and severance taxes	115.5	115.7	120.7
Special items (B)	414.4	—	—
	<u>9,817.9</u>	<u>8,995.7</u>	<u>8,300.5</u>
Earnings			
Income before taxes on income	1,047.2	2,165.8	1,635.1
Provision for taxes on income (H)	393.8	798.4	598.3
Income from operations	653.4	1,367.4	1,036.8
Minority interests (O)	(358.2)	(422.5)	(175.4)
Net Income	<u>\$ 295.2</u>	<u>\$ 944.9</u>	<u>\$ 861.4</u>
Earnings per Common Share (J)	<u>\$ 3.40</u>	<u>\$ 10.67</u>	<u>\$ 9.74</u>

The accompanying notes are an integral part of the financial statements.

AR 0909

Consolidated Balance Sheet

(in millions)

Alcoa and subsidiaries

December 31	1990	1989
Assets		
Current assets:		
Cash	\$ 60.1	\$ 98.1
Short-term investments, at cost which approximates market	576.0	706.9
Receivables from customers, less allowances: 1990-\$14.9; 1989-\$11.8	1,420.9	1,327.7
Other receivables	184.0	199.5
Inventories (C)	1,374.8	1,240.0
Prepaid expenses and other current assets	128.2	165.3
Total current assets	3,744.0	3,737.5
Properties, plants and equipment (D)	6,747.0	6,658.6
Other assets (E)	922.2	1,144.5
Total assets	\$11,413.2	\$11,540.6
Liabilities		
Current liabilities:		
Short-term borrowings	\$ 132.5	\$ 103.9
Accounts payable, trade	763.2	742.1
Accrued compensation and retirement costs	199.3	215.6
Taxes, including taxes on income	500.4	567.1
Other current liabilities	382.2	317.5
Long-term debt due within one year	60.1	196.4
Total current liabilities	2,037.7	2,142.6
Long-term debt, less amount due within one year (F)	1,295.3	1,316.3
Noncurrent liabilities and deferred credits	572.4	429.6
Future taxes on income	763.5	852.1
Total liabilities	4,668.9	4,740.6
Minority Interests (I)	1,581.0	1,533.1
Contingent liabilities (Q)	—	—
Shareholders' Equity		
Preferred stock (I)	55.8	66.0
Common stock (I)	88.8	88.8
Additional capital	713.5	707.4
Translation adjustment	92.9	46.4
Retained earnings	4,473.1	4,448.8
Treasury stock, at cost	(260.8)	(90.5)
Total shareholders' equity	5,163.3	5,266.9
Total liabilities and equity	\$11,413.2	\$11,540.6

The accompanying notes are an integral part of the financial statements.

AR 0910

Statement of Consolidated Cash Flows

(in millions)

Alcoa and subsidiaries

For the year ended December 31	1990	1989	1988
Cash from Operations			
Income from operations	\$ 653.4	\$1,367.4	\$1,036.8
Adjustments for noncash transactions:			
Depreciation, depletion and amortization	717.7	664.0	645.3
Reduction of assets to net realizable value	222.9	—	—
Increase (reduction) in future taxes on income	(88.6)	82.0	96.8
Equity earnings before additional taxes, net of dividends	29.9	(47.1)	(7.1)
Provision for special items	191.5	—	—
(Gains) losses from financing and investment transactions	.4	(20.8)	(32.1)
Book value of asset disposals	17.2	19.3	20.0
Other	(3.2)	14.3	(27.2)
(Increase) reduction in receivables	(39.5)	74.6	(282.7)
(Increase) in inventories	(104.4)	(198.9)	(108.5)
(Increase) reduction in prepaid expenses and other current assets	66.9	(40.3)	(85.2)
Increase in accounts payable and accrued expenses	31.5	33.9	87.6
Increase (reduction) in taxes, including taxes on income	(74.3)	110.8	315.8
Net change in noncurrent assets and liabilities	(34.7)	(88.4)	57.6
Cash from operations	1,586.7	1,970.8	1,717.1
Financing Activities			
Common stock issued and treasury stock sold	8.2	34.4	4.2
Repurchase of common stock	(182.1)	(100.9)	—
Repurchase of preferred stock	(4.3)	—	—
Additions to (reductions of) minority interests	(18.3)	54.1	297.0
Dividends paid to shareholders	(267.1)	(242.9)	(117.2)
Dividends paid to minority interests	(299.6)	(217.3)	(94.9)
Additions to long-term debt	330.7	121.6	125.3
Payments on long-term debt	(499.6)	(240.4)	(974.5)
Payments on long-term debt—acquired subsidiaries	—	(236.0)	—
Cash used for financing activities	(932.1)	(827.4)	(760.1)
Investing Activities			
Capital expenditures	(850.9)	(875.7)	(866.0)
Acquisition of subsidiaries, net of cash acquired	(13.7)	(44.5)	(20.0)
Sale of subsidiaries	—	59.7	139.5
Other—receipts	56.0	66.1	103.1
—payments	(29.9)	(36.3)	(86.4)
Cash used for investing activities	(838.5)	(830.7)	(729.8)
Effect of exchange rate changes on cash	15.0	(14.5)	16.1
Changes in Cash			
Net change in cash and short-term investments	(168.9)	298.2	243.3
Cash and short-term investments at beginning of year	805.0	506.8	263.5
Cash and short-term investments at year-end	\$ 636.1	\$ 805.0	\$ 506.8

The accompanying notes are an integral part of the financial statements.

AR 0911

Statement of Consolidated Shareholders' Equity

(in millions, except share amounts)

Alcoa and subsidiaries

December 31	Preferred stock	Common stock	Additional capital	Translation adjustment	Retained earnings	Treasury stock	Shareholders' equity
Balance at end of 1987	\$66.0	\$88.1	\$676.3	\$74.3	\$3,006.0		\$3,910.7
Net income—1988					861.4		861.4
Cash dividends:							
Preferred @ \$3.75 per share					(2.5)		(2.5)
Common @ \$1.30 per share					(114.7)		(114.7)
Stock issued under incentive, option and savings plans		.2	4.2				4.4
Translation adjustments				(23.8)			(23.8)
Balance at end of 1988	66.0	88.3	680.5	50.5	3,750.2		4,635.5
Net income—1989					944.9		944.9
Cash dividends:							
Preferred @ \$3.75 per share					(2.5)		(2.5)
Common @ \$2.72 per share					(240.4)		(240.4)
Stock issued under incentive, option and savings plans		.5	26.9		(3.4)	\$ 10.4	34.4
Translation adjustments				(4.1)			(4.1)
Treasury shares purchased						(100.9)	(100.9)
Balance at end of 1989	66.0	88.8	707.4	46.4	4,448.8	(90.5)	5,266.9
Net income—1990					295.2		295.2
Cash dividends:							
Preferred @ \$3.75 per share					(2.2)		(2.2)
Common @ \$3.05 per share					(264.9)		(264.9)
Stock issued under incentive, option and savings plans			.2		(3.8)	11.8	8.2
Translation adjustments				46.5			46.5
Treasury shares purchased						(182.1)	(182.1)
Shares retired	(10.2)		5.9				(4.3)
Balance at end of 1990	\$55.8	\$88.8	\$713.5	\$92.9	\$4,473.1	\$(260.8)	\$5,163.3

Share Activity

	Preferred stock	Common stock		
		Issued	Treasury	Net outstanding
Balance at end of 1987	659,909	88,137,422		88,137,422
Stock issued under incentive, option and savings plans		145,052		145,052
Balance at end of 1988	659,909	88,282,474		88,282,474
Stock issued under incentive, option and savings plans		521,746	137,213	658,959
Treasury shares purchased			(1,393,000)	(1,393,000)
Balance at end of 1989	659,909	88,804,220	(1,255,787)	87,548,433
Stock issued under incentive, option and savings plans			155,617	155,617
Treasury shares purchased			(2,861,700)	(2,861,700)
Shares retired	(102,140)			
Balance at end of 1990	557,769	88,804,220	(3,961,870)	84,842,350

The accompanying notes are an integral part of the financial statements.

AR 0912

Notes to Financial Statements

(dollars in millions, except share amounts)

A. Summary of Significant Accounting Policies

Principles of Consolidation. The consolidated financial statements include the accounts of Alcoa and companies more than 50% owned. Also included are joint ventures in which Alcoa has an undivided interest. Investments in other entities are accounted for principally on the equity basis.

Inventory Valuation. Inventories are carried at the lower of cost or market, with cost for a substantial portion of U.S. inventories determined under the last-in, first-out (LIFO) method. The cost of other inventories is principally determined under the average cost method.

Depreciation, Depletion and Amortization. Depreciation is recorded principally on the straight-line method at rates based on the estimated useful lives of the assets. The book value of obsolete assets is charged to depreciation expense when they are scrapped. Profits or losses from the sale of assets are included in other income. Repairs and maintenance are charged to expense as incurred.

Depletion is taken over the periods the estimated mineral reserves are extracted. Intangibles, such as goodwill and patents, are amortized over their estimated lives.

Environmental Expenditures. Expenditures that relate to current operations are expensed or capitalized, as appropriate. Expenditures that relate to an existing condition caused by past operations, and which do not contribute to future revenues, are expensed. Liabilities are recorded when remedial efforts are probable and the costs can be reasonably estimated.

Interest Costs. Interest related to construction of qualifying assets is capitalized as part of construction costs.

Futures Contracts. Alcoa periodically enters into forward exchange and commodity futures contracts which are primarily accounted for as hedges of its revenues and costs. The gains and losses on these contracts are reflected in earnings concurrently with the hedged revenues or costs. The cash flows from these contracts are classified in a manner consistent with the underlying nature of the transactions.

Income Taxes. Future taxes on income are provided for timing differences in the recognition of income and expense items for financial and tax purposes in accordance with Accounting Principles Board Opinion No. 11. Investment tax credits reduce income tax expense in the year in which the related assets are placed in service or when qualified progress payments are made.

Foreign Currency. The U.S. dollar is the functional currency for Alcoa's significant operations outside the U.S.

B. Special Items

In the 1990 fourth quarter Alcoa recorded a special charge of \$414.4 (\$275.0 aftertax). Of the total charge, \$212.8 is associated with writedowns reflecting the decline in the value of certain business assets, mainly related to non-aluminum activities; \$136.4 is related to environmental clean-up activities at the company's U.S. plant sites; and \$65.2 reflects an anticipated loss from the sale of the Astech Division of Alcoa Composites, Inc., an Alcoa subsidiary.

C. Inventories

December 31	1990	1989
Finished goods	\$ 326.5	\$ 268.5
Work in process	479.1	465.4
Bauxite and alumina	214.2	189.3
Purchased raw materials	224.5	219.4
Operating supplies	130.5	97.4
	<u>\$ 1,374.8</u>	<u>\$ 1,240.0</u>

Approximately 59% of total inventories at December 31, 1990 were valued on a LIFO basis. If valued on an average cost basis, total inventories would have been \$828.0 and \$861.0 higher at the end of 1990 and 1989, respectively.

D. Properties, Plants and Equipment, at Cost

December 31	1990	1989
Land and land rights, including mines	\$ 235.6	\$ 228.9
Structures	3,537.9	3,380.5
Machinery and equipment	8,676.8	8,074.5
	<u>12,450.3</u>	<u>11,683.9</u>
Less, accumulated depreciation and depletion	6,172.4	5,578.4
	<u>6,277.9</u>	<u>6,105.5</u>
Construction work in progress	469.1	553.1
	<u>\$ 6,747.0</u>	<u>\$ 6,658.6</u>

E. Other Assets

December 31	1990	1989
Investments	\$ 198.9	\$ 229.9
Intangibles, net of accumulated amortization of \$221.5 in 1990 and \$92.8 in 1989	192.9	303.4
Deferred charges	254.9	238.1
Other, principally noncurrent receivables	275.5	373.1
	<u>\$ 922.2</u>	<u>\$ 1,144.5</u>

December 31	1990	1989
Sinking fund debentures:		
6% due 1992	\$ 8.9	\$ 9.7
9% due 1995	35.0	41.5
7.45% due 1996	38.6	41.6
9.45% due 2000	76.3	85.0
Notes:		
8 1/4% due 1990	—	97.5
9 3/4% due 1990	—	40.0
Convertible subordinated debentures:		
6 1/4%, due 2002, exchangeable @ \$62/share	150.0	150.0
Discount debentures:		
7%, \$300 face amount, due 1996 (14.7% effective yield)	211.1	202.1
7%, \$225 face amount, due 2011 (14.7% effective yield)	113.8	113.0
Commercial paper (8.0% average rate)	76.8	—
Tax exempt revenue bonds ranging from 5 1/4% to 12 3/4%, due 1993-2012	122.1	122.1
Other	106.5	114.3
Alcoa Aluminio:		
Variable rate note due 1991-1997 (10.1% and 11.3% average rate)	233.1	263.6
Alcoa of Australia (AA):		
11% note due 1992	80.0	80.0
14.25% note due 1991-1994	15.8	20.3
Revolving credit agreements:		
Variable rate, due 1997 (8.2% average rate)	47.0	—
Variable rate, due 1997 (12.3% average rate)	40.4	—
Variable rates, due 1991-1992 (8.6%-17.5% average rates)	—	132.0
	1,355.4	1,512.7
Less, amount due within one year	60.1	196.4
	\$1,295.3	\$1,316.3

The amount of long-term debt maturing in each of the next five years is \$60.1 in 1991, \$148.7 in 1992, \$152.9 in 1993, \$85.2 in 1994 and \$72.2 in 1995. AA has deposited sufficient funds with banks to retire the 11% notes due 1992. The banks have assumed liability for all future principal payments. Aluminio has interest-bearing funds on deposit with a bank which will satisfy debt maturing in 1991 of \$17.4. The deposit protects Aluminio from adverse foreign exchange exposure.

A five-year multiple option loan facility was increased from \$500 to \$753 in 1990 which may be used to back up commercial paper borrowings. See "Other Developments" in the Financial Review section for additional information.

Under a power contract that expires no earlier than 2011, Alcoa is entitled to a fixed percentage of the annual output from a Northwest U.S. hydroelectric facility. Alcoa makes minimum annual payments of \$4 whether or not it receives power. Alcoa could be required to increase its participation if other parties to the contract defaulted. If all other parties had defaulted as of December 31, 1990, Alcoa's maximum liability would have been about \$200. There is no reason to believe the other parties will default or that power will not be provided.

At December 31, 1990 Alcoa had open currency exchange commitments of \$2,221. These contracts are part of a worldwide

program to minimize foreign exchange operating income and balance sheet exposure. The contracts generally mature within 12 months and are principally unsecured forward exchange contracts with banks.

The components of income before U.S. and foreign taxes on income were:

	1990	1989	1988
U.S.	\$ (177.2)	\$ 626.1	\$ 837.0
Foreign	1,224.4	1,539.7	798.1
	\$1,047.2	\$2,165.8	\$1,635.1

The provision for taxes on income consisted of:

	1990	1989	1988
Provision for U.S. taxes:			
Current	\$ 98.7	\$212.4	\$269.1
Future	(122.2)	97.2	65.3
Foreign taxes:			
Current	406.3	446.0	243.6
Future	11.0	42.8	20.3
	\$393.8	\$798.4	\$598.3

* Excludes state and local income taxes of \$10.2 in 1990, \$31.3 in 1989 and \$37.3 in 1988; includes U.S. taxes related to foreign income

The provision for taxes on income represented effective tax rates of 37.6% in 1990, 36.9% in 1989 and 36.6% in 1988. The difference between these rates and the U.S. statutory rate of 34% resulted from:

	1990	1989	1988
% of income before taxes			
Investment credits	(.6)	(.4)	(.3)
Taxes on foreign income	4.6	3.3	2.1
Other	(.4)	—	.8
	3.6	2.9	2.6

The components of the provision for future taxes were:

	1990	1989	1988
Depreciation	\$ 42.6	\$ 72.5	\$72.7
Employee benefits	(10.7)	15.0	16.2
Loss provisions not currently deductible	(121.0)	.3	4.9
Deferred income	(18.5)	53.7	(6.7)
Other	(3.6)	(1.5)	(1.5)
	\$ (111.2)	\$140.0	\$85.6

Investment credits and allowances included in income were \$6.1 in 1990, \$9.2 in 1989 and \$5.9 in 1988.

The cumulative amount of Alcoa's share of undistributed earnings for which no deferred taxes have been provided was \$1,448.9 at December 31, 1990. Management has no plans to distribute such earnings in the foreseeable future.

Alcoa and the Internal Revenue Service (IRS) have settled consolidated tax returns through 1982. Alcoa received deficiency notices from the IRS for the years 1983 and 1984. In the opinion of management, settlement of these issues would have had an insignificant effect on the financial position of the company at December 31, 1990.

I. Preferred and Common Stock

Preferred Stock. Alcoa has two classes of preferred stock. The serial preferred stock has 557,860 shares authorized, with a par value per share of \$100 and an annual \$3.75 per share cumulative dividend preference. The Class B serial preferred stock has 10,000,000 shares authorized (none issued) and a par value of \$1 per share.

Common Stock. There are 300,000,000 shares authorized at a par value of \$1 per share. As of December 31, 1990, shares of common stock reserved for issuance were:

	Number of shares
Convertible debentures	2,419,355
Long-term stock incentive plan	4,281,758
Salaried employees' savings plan	2,048,766
Incentive compensation plan	91,149
	8,841,028

Stock options under the long-term stock incentive plan have been and may be granted, generally at not less than market prices on the dates of grant. At December 31, 1990, options for 1,818,077 shares were exercisable.

The transactions for shares under option were:

	1990	1989	1988
Outstanding, beginning of year:			
Number	1,953,888	2,164,885	1,733,335
Price	\$26.38-74.88	\$26.00-55.38	\$23.56-55.38
Granted:			
Number	779,016	662,639	648,850
Price	\$1.00-76.88	\$62.13-74.88	\$52.56
Exercised:			
Number	(212,826)	(855,636)	(200,525)
Price	\$1.00-62.13	\$26.00-55.38	\$23.56-46.88
Expired or canceled	(49,530)	(18,000)	(16,775)
Outstanding, end of year:			
Number	2,470,548	1,953,888	2,164,885
Price	\$1.00-76.88	\$26.38-74.88	\$26.00-55.38
Shares reserved for future options at end of year	1,811,210	1,399,120	2,043,759

In 1986 Alcoa adopted a shareholder rights plan under which each share of common stock had a right that traded with the stock until the right became exercisable. In the 1990 third quarter Alcoa redeemed all outstanding rights at a cost of five cents per right, or \$4.3.

J. Earnings per Common Share

Primary earnings per common share are computed by subtracting annual preferred dividend requirements from net income, and dividing that amount by the weighted average number of common shares outstanding during each year. The average number of shares used to compute primary earnings per common share was 86,204,179 in 1990, 88,304,110 in 1989 and 88,201,595 in 1988. Fully diluted earnings per common share are not stated since the dilution is not material.

K. Lease Expense

Certain equipment, warehousing and office space, and ocean-going vessels are under operating lease agreements. Total expense for all leases was \$80.6 in 1990, \$66.7 in 1989 and \$61.6 in 1988. Under long-term leases, minimum annual rentals are \$40.8 in 1991, \$32.0 in 1992, \$27.0 in 1993, \$22.3 in 1994, \$14.0 in 1995 and a total of \$38.6 for 1996 and thereafter.

L. Interest Cost Components

	1990	1989	1988
Amount charged to expense	\$184.7	\$178.3	\$208.4
Amount capitalized	20.5	18.5	21.2
	\$205.2	\$196.8	\$229.6

M. Postretirement Benefits

Alcoa and certain subsidiaries provide health care and life insurance benefits for eligible retired employees. A significant majority of all U.S. employees and certain other employees qualify if they become eligible for retirement while working for the company. Alcoa retains the right, subject to existing agreements, to amend or terminate these benefits. The costs of these benefits are expensed when claims are paid and were \$52.8 in 1990, \$43.1 in 1989 and \$38.5 in 1988. Alcoa also made Medicare reimbursements of \$8.2 in 1990, \$10.4 in 1989 and \$6.9 in 1988. At December 31, 1990, there were approximately 23,500 eligible retirees.

An accounting standard for postretirement benefits was issued in late 1990. Under the new rules, the estimated costs of these benefits must be accrued ratably from the date of hire until the employee is eligible to receive the benefits, rather than as claims are paid. The liability for unaccrued postretirement costs for eligible retirees is expected to be material. Companies have an option to either record this liability in one lump sum or amortize it over a specified period. There also will be a substantial increase in the annual amount of benefits charged to expense. Alcoa must make the accounting change by 1993.

N. Pension Plans

Alcoa and certain subsidiaries maintain pension plans covering substantially all U.S. employees and certain other employees. Pension benefits generally depend upon length of service, job grade and remuneration. Substantially all benefits are paid through pension trusts that are funded in amounts sufficient to ensure that all plans have adequate funds to pay benefits to retirees as they become due.

Pension costs include the following components which were calculated as of January 1 of each year:

	1990	1989	1988
Benefits earned	\$ 76.2	\$ 66.2	\$ 50.5
Interest accrued on projected benefit obligation	229.6	220.1	211.0
Net amortization	16.8	15.0	2.2
	322.6	301.3	263.7
Less: expected return on plan assets*	236.7	211.1	195.4
	\$ 85.9	\$ 90.2	\$ 68.3

*The actual returns were higher (lower) than the expected returns by \$(183.7) in 1990, \$185.4 in 1989 and \$32.6 in 1988 and were deferred as actuarial gains (losses).

The following table describes the funded status of the pension plans. The funded status of a plan is defined as the difference between the accumulated benefit obligation (actuarial present value of benefits earned to date based on present pay levels) and the amount provided for future benefits.

	December 31, 1990		December 31, 1989	
	Over-funded plans	Under-funded plans	Over-funded plans	Under-funded plans
Accumulated benefit obligation:				
Vested	\$ 1,239.7	\$ 1,363.5	\$ 2,517.1	\$ 27.4
Non-vested	114.3	118.5	196.5	3.0
Additional obligation for projected compensation increases	64.5	139.1	160.2	8.5
Projected benefit obligation	1,418.5	1,621.1	2,873.8	38.9
Plan assets, primarily stocks and bonds, at market	1,441.6	1,353.8	2,890.8	.5
(Prepaid) accrued pension costs	(48.8)	64.6	(48.6)	18.5
Amount provided for future benefits	1,392.8	1,418.4	2,842.2	19.0
Projected benefit obligation in excess of amount provided for future benefits	\$ 25.7	\$ 202.7	\$ 31.6	\$ 19.9
Consists of:				
Unamortized initial obligations of plans	\$ (62.0)	\$ 78.8	\$ 6.7	\$ 12.9
Unamortized prior service costs	45.3	103.8	63.1	(1.5)
Unrecognized net actuarial (gains) losses	42.4	20.1	(38.2)	8.5
	\$ 25.7	\$ 202.7	\$ 31.6	\$ 19.9

For the underfunded plans at December 31, 1990 and 1989, Alcoa recorded a deferred charge and an additional liability of \$63.6 and \$11.4, respectively. These amounts are the difference between the accumulated benefit obligation and the amount provided for future benefits.

The projected benefit obligation at December 31 was determined using a settlement discount rate of 8% for 1990 and 1989, and 8.75% for 1988. The assumed long-term rate for compensation increases was 5.5% for all three years. Assumed earnings on plan assets used for determining pension expense was 9% for all three years.

O. Minority Interests

Alcoa's consolidated financial statements include 100% of the assets, liabilities and earnings of companies that are more than 50%-owned by Alcoa. The ownership interests of the other shareholders in these companies are called minority interests. The \$358.2 reduction in Alcoa's 1990 net income is the minority shareholders' share of earnings of these subsidiaries.

The following table summarizes the minority shareholders' interests in the equity of these subsidiaries.

December 31	1990	1989
Alcoa of Australia	\$ 762.2	\$ 688.3
Alcoa International Holdings Company (AIHC)	250.0	250.0
Alcoa Aluminio	202.8	223.9
Alcoa Brazil Holdings Company	99.8	109.0
Other majority-owned companies	266.2	261.9
	\$ 1,581.0	\$ 1,533.1

AIHC's minority interests consist of five series of preferred stock with a weighted average annual dividend rate of 8.8% until 1991.

Alcoa Aluminio's minority interests include \$214.7 of convertible preferred stock with an annual dividend of \$18.4. See Note S for further details on Aluminio's restructuring in 1989.

P. Cash Payments for Interest and Taxes

Cash payments for interest were: 1990-\$198.6, 1989-\$189.1 and 1988-\$246.4. Cash payments for income taxes were: 1990-\$488.0, 1989-\$545.7 and 1988-\$271.9.

All short-term investments qualify as cash equivalents.

Various lawsuits and claims and proceedings have been or may be instituted or asserted against Alcoa and its subsidiaries, including those pertaining to environmental, product liability and safety and health matters. While the amounts claimed may be substantial and the ultimate liability cannot now be determined, management believes the disposition of matters that are pending or asserted will not have a material adverse effect on the financial position of the company.

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B. Segment and Geographic Area Information

Alcoa is primarily an integrated producer of aluminum products. Alcoa's operations consist of three segments: Alumina and Chemicals, Aluminum Processing, and Non-Aluminum Products.

The Alumina and Chemicals segment includes the production and sale of bauxite, alumina and alumina chemicals, and related transportation services for this segment.

The Aluminum Processing segment includes the production and sale of molten metal, ingot, and aluminum products that are flat-rolled, engineered or finished. Also included are power, transportation and other services for this segment.

The Non-Aluminum Products segment includes the production and sale of electrical, ceramic, plastic and composite materials products, manufacturing equipment, gold, separations systems, magnesium products and steel and titanium forgings.

Segment information	1990	1989	1988
Sales to customers:			
Alumina and chemicals	\$ 1,842.2	\$ 1,743.4	\$ 1,215.5
Aluminum processing	7,477.8	8,019.1	7,677.2
Non-aluminum products	1,390.2	1,147.5	902.6
Intersegment sales: (1)			
Alumina and chemicals	1,423.7	1,172.3	622.7
Aluminum processing	5.5	3.1	.8
Non-aluminum products	89.5	115.5	111.7
Eliminations	(1,518.7)	(1,290.9)	(735.2)
Total sales and operating revenues	\$10,710.2	\$10,910.0	\$ 9,795.3
Operating profit: (2)			
Alumina and chemicals	\$ 1,319.3	\$ 1,182.8	\$ 418.9
Aluminum processing	32.5	901.7	1,332.3
Non-aluminum products	(270.6)	32.9	(11.2)
Unallocated	6.0	6.5	.5
Total operating profit	1,087.2	2,123.9	1,740.5
Other income	154.9	251.5	140.3
Interest expense	184.7	178.3	208.4
State and local taxes on income	10.2	31.3	37.3
Income before taxes on income	\$ 1,047.2	\$ 2,165.8	\$ 1,635.1
Identifiable assets:			
Alumina and chemicals	\$ 2,855.3	\$ 2,480.8	\$ 2,577.4
Aluminum processing	6,983.9	7,123.7	6,477.3
Non-aluminum products	1,292.9	1,422.3	1,145.2
Total identifiable assets	11,132.1	11,026.8	10,199.9
Investments	198.9	229.9	197.1
Corporate assets	82.2	283.9	140.5
Total assets	\$11,413.2	\$11,540.6	\$10,537.5
Depreciation and depletion:			
Alumina and chemicals	\$ 144.8	\$ 145.6	\$ 154.5
Aluminum processing	464.1	434.0	407.0
Non-aluminum products	98.6	75.6	76.5
Total depreciation and depletion (3)	\$ 707.5	\$ 655.2	\$ 638.0
Capital expenditures:			
Alumina and chemicals	\$ 148.5	\$ 175.6	\$ 110.7
Aluminum processing	610.8	595.3	652.3
Non-aluminum products	91.6	104.8	103.0
Total capital expenditures	\$ 850.9	\$ 875.7	\$ 866.0

Geographic area information	1990	1989	1988
Sales to customers:			
USA	\$ 6,383.5	\$ 6,696.4	\$ 6,254.9
Other Americas	1,206.0	1,392.0	1,243.8
Pacific	2,124.1	2,039.7	1,510.3
Europe	996.6	781.9	786.3
Transfers between geographic areas: (1)			
USA	845.9	818.9	590.6
Other Americas	396.9	377.4	235.5
Pacific	374.4	348.1	132.2
Europe	51.1	72.2	21.2
Eliminations	(1,668.3)	(1,616.6)	(979.5)
Total sales and operating revenues	\$10,710.2	\$10,910.0	\$ 9,795.3
Operating profit: (2)			
USA	\$ (147.1)	\$ 652.2	\$ 921.8
Other Americas	219.2	392.2	317.3
Pacific	930.0	1,017.8	413.7
Europe	85.1	61.7	87.7
Total operating profit	\$ 1,087.2	\$ 2,123.9	\$ 1,740.5
Identifiable assets:			
USA	\$ 5,998.9	\$ 6,127.7	\$ 5,592.6
Other Americas	1,506.5	1,592.9	1,612.9
Pacific	2,877.6	2,638.9	2,383.9
Europe	749.1	667.3	610.5
Total identifiable assets	11,132.1	11,026.8	10,199.9
Investments	198.9	229.9	197.1
Corporate assets	82.2	283.9	140.5
Total assets	\$11,413.2	\$11,540.6	\$10,537.5
Capital expenditures:			
USA	\$ 592.0	\$ 605.8	\$ 601.7
Other Americas	124.2	85.7	60.3
Pacific	94.6	138.5	137.9
Europe	40.1	45.7	66.1
Total capital expenditures	\$ 850.9	\$ 875.7	\$ 866.0

(1) Transfers between segments and geographic areas are based on generally prevailing market prices.

(2) Operating profit, excluding the special items of \$414.4 described in Note B, follows:

	1990
Segment:	
Alumina and chemicals	\$1,334.6
Aluminum processing	200.1
Non-aluminum products	(39.1)
Unallocated	6.0
	\$1,501.6
Geographic area:	
USA	\$ 262.2
Other Americas	219.2
Pacific	930.0
Europe	90.2
	\$1,501.6

(3) Includes depreciation of \$17.6 in 1990, \$16.9 in 1989 and \$14.8 in 1988 reported as research and development expenses in the income statement.

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S. Majority-owned Subsidiaries

The condensed financial statements of the principal majority-owned subsidiaries follow.

Alcoa Aluminio S.A. (Aluminio). Summarized consolidated financial data for Aluminio, a 59%-owned* Brazilian subsidiary (65% in 1988), follows.

December 31	1990	1989
Cash and short-term investments	\$ 13.6	\$ 60.4
Other current assets	261.1	308.0
Properties, plants and equipment, net	927.8	914.9
Other assets	94.3	101.8
Total assets	1,296.8	1,385.1
Current liabilities	238.0	223.4
Long-term debt†	220.2	251.6
Other liabilities	15.7	24.4
Total liabilities	473.9	499.4
Net assets	\$ 822.9	\$ 885.7

* In April 1989 Alcoa Brazil Holdings Company (ABHC) increased its ownership in Aluminio to 75% by converting \$204.5 of debt into additional common stock. At the same time, ABHC sold 21% of its common stock to Aluminio's minority shareholder. As a result of these transactions, Alcoa's effective ownership in Aluminio was reduced to 59%.

† Held by ABHC—\$22.5

	1990	1989	1988
Revenues	\$ 862.4	\$ 949.5	\$ 886.9
Costs and expenses	(861.6)	(691.7)	(660.5)
Translation and exchange adjustments	8.6	(37.1)	(55.0)
Income tax expense	(8.1)	(44.6)	(10.4)
Net income	\$ 1.3	\$ 176.1	\$ 161.0

Alcoa of Australia Limited (AA). Summarized consolidated financial data for AA, a 51%-owned subsidiary of Alcoa International Holdings Company, follows.

December 31	1990	1989
Cash and short-term investments	\$ 394.2	\$ 296.9
Other current assets	671.1	525.1
Properties, plants and equipment, net	1,559.3	1,585.1
Other assets	172.8	165.4
Total assets	2,797.4	2,572.5
Current liabilities	695.9	588.5
Long-term debt	178.7	227.8
Other liabilities	367.4	351.5
Total liabilities	1,242.0	1,167.8
Net assets	\$1,555.4	\$1,404.7

	1990	1989	1988
Revenues*	\$ 2,422.0	\$ 2,318.4	\$ 1,532.0
Costs and expenses	(1,484.6)	(1,377.1)	(1,025.0)
Translation and exchange adjustments	4.7	41.7	(105.7)
Income tax expense	(328.1)	(370.0)	(191.3)
Net income	\$ 614.0	\$ 613.0	\$ 210.0

* Revenues from Alcoa were \$377.6 in 1990, \$364.2 in 1989 and \$149.3 in 1988. The terms of the transactions were established by negotiation between the parties.

Supplemental Financial Information

(dollar amounts in millions, except per share data)

Quarterly Data (unaudited)

1990	First	Second	Third	Fourth	Year
Sales and operating revenues	\$2,636.3	\$2,691.4	\$2,676.1	\$2,706.4	\$10,710.2
Income from operations	231.7	251.4	210.3	(40.0)	653.4
Net income*	148.6	161.9	125.1	(140.4)	295.2
Earnings per common share*	1.69	1.86	1.46	(1.61)	3.40

1989	First	Second	Third	Fourth	Year
Sales and operating revenues	\$2,624.4	\$2,757.8	\$2,834.4	\$2,693.4	\$10,910.0
Income from operations	392.1	398.5	315.9	260.9	1,367.4
Net income	276.0	285.2	219.0	164.7	944.9
Earnings per common share	3.12	3.21	2.46	1.88	10.67

* Includes special charge of \$275.0, or \$3.19 per common share, in the fourth quarter

Average Number of Employees (unaudited)

	1990	1989	1988
USA	36,600	35,100	34,000
Other Americas	16,600	15,200	15,000
Pacific	6,600	6,500	6,000
Europe	3,900	3,800	4,000
	63,700	60,600	59,000

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Officers

(as of February 15, 1991)

Management Committee

Paul H. O'Neill
Chairman of the Board and
Chief Executive Officer

C. Fred Fetterolf
President and Chief
Operating Officer

Peter R. Bridenbaugh
Vice President—Research
and Development

Thomas L. Carter
Vice President—Quality

John L. Diederich
Group Vice President—
Metals and Chemicals

Richard L. Fischer
Senior Vice President—
Corporate Development
and General Counsel

Ronald R. Hoffman
Group Vice President—
Packaging Systems

Vincent R. Scorsone
Group Vice President—
Aerospace and Industrial
Products

Donald R. Whitlow
Senior Vice President—
Employee Relations

James W. Wirth
Senior Vice President—
Finance

Bruce R. Barstow
Vice President and Director
General—Grupo Aluminio

Alain Belda
Vice President—
Latin America

George E. Bergeron
Vice President and General
Manager—Rigid Packaging

Earnest J. Edwards
Vice President and
Controller

Charles P. Fletcher
Vice President—Engineering

Albert E. Germain
Vice President—Taxes and
Tax Counsel

Clyde R. Gillespie
Vice President and
General Manager—Forgings
and Castings

Harry M. Goern
Vice President—
Procurement and
Transportation

Jan H. M. Hommen
Vice President and
Treasurer

Frank P. Jones, Jr.
Vice President—
Government Affairs

Charles K. Ligon
Vice President—Separations

M. Sandy Nelson, Jr.
Vice President and General
Manager—Sheet and Plate

Richard C. Rawe
Vice President—Primary
Metals

Robert A. Reed
Secretary and Assistant
General Counsel

Robert F. Slagle
Vice President—Raw
Materials, Alumina and
Industrial Chemicals

Norman F. Stephen
Vice President and
Managing Director—Alcoa
of Australia Limited

Thomas J. Taylor
Vice President—Metal
Sales, Trading and
Recycling

G. Keith Turnbull
Vice President—Technology
Planning

Assistant Officers

David W. Brownlee
Patent Counsel

Robert D. Buchanan
Senior Assistant Controller

Edgar M. Cheely, Jr.
Assistant Treasurer

Denis A. Demblowski
Assistant Secretary

Donald E. Guinn
Assistant General Counsel

R. Lee Holz
Assistant General Counsel

Richard B. Kelson
Assistant General Counsel

Harold E. Meeks
Assistant Treasurer

Russell W. Porter, Jr.
Assistant General Counsel

Directors

William S. Cook, 1985
Director of various
companies and former
Chairman and Chief
Executive Officer of
Union Pacific Corporation

Kenneth W. Dam, 1987†
Vice President—Law
and External Relations,
International Business
Machines Corporation, a
computer and information
processing systems company

John P. Diesel, 1980†
Former President of
Tenneco, Inc.

C. Fred Fetterolf, 1983†

Joseph T. Gorman, 1991
Chairman, President and
Chief Executive Officer,
TRW Inc., a global company
serving the space and
defense, automotive and
information systems markets

Judith M. Gueron, 1988‡
President, Manpower
Demonstration Research
Corporation, a nonprofit
research organization

John P. Mulroney, 1987
President and Chief
Operating Officer, Rohm and
Haas Company, a specialty
chemicals manufacturer

Paul H. O'Neill, 1986†

Sir Arvi Parbo, 1980
Chairman, Western Mining
Corporation Limited, an
Australian exploration and
mining company, and
Chairman of Alcoa of
Australia Limited

Forrest N. Shumway, 1982‡
Director of various
companies and former
Vice Chairman of
Allied-Signal, Inc.

Franklin A. Thomas, 1977†‡
President, The Ford
Foundation, a nonprofit
charitable foundation

◇Date following the name
indicates the year first
elected Director

†Member of the Executive
Committee

‡Member of the Audit Committee

Alcoa Foundation

Alcoa Foundation's mission for 38 years has been to improve the quality of life through philanthropy primarily in the communities where Alcoa operations and offices are located.

Education received 45% of the foundation's philanthropic dollars during 1990. Most of the money went to colleges and universities. The foundation awarded 54 scholarships to the children of Alcoa employees and retirees. Foundation grants also supported the arts and culture as well as nonprofit organizations. Some examples of community programs included disaster relief, food banks and shelters for the homeless, drug and alcohol rehabilitation programs, and family counseling services.

Approximately 2,600 grants accounted for the \$12.1 million given in 1990. Included was \$1.3 million to double-match 2,912 employee and retiree gifts to 533 educational institutions.

Since its founding in 1952, Alcoa Foundation has given over \$175 million worldwide.

Following are examples of foundation grants in 1990:

- > A grant was given to the school system in Alcoa, Tenn. for Vanderbilt University's "Jasper Summer Institute" program. The program includes training teachers and corporate volunteers to use video to teach students. The video series simulates real-life problems, encouraging children to apply their knowledge of math and science.
- > A grant to United Way International was allocated among 36 separate nonprofit agencies in Mexico. They include hospitals, orphanages, retirement communities, shelters for the homeless and educational facilities.
- > The foundation supported Affiliate Artists, New York City, by sponsoring four residencies for solo artists. Participating artists go directly to Alcoa plant communities, offering the residents an opportunity to see live, quality performances.
- > The Ministry of Health of the Government of Suriname received a grant to purchase a bus for the Recreational Center for Handicapped Children in Paramaribo, the country's capital. The bus will transport the children to schools, workplaces and physical training facilities throughout the city.
- > Carlow College in Pittsburgh, Pa. is using a grant to enable six disadvantaged women to earn college degrees. The grant is also for books and supplies for the neediest students.
- > Support to the Salvation Army in Sidney, Ohio was shared by four major community projects: the renovation of an emergency shelter for the homeless; construction of a 14,000 square foot addition to a day-care facility for low- and middle-income families; expansion of facilities for an after-school service for families with limited economic means; and the renovation of the kitchen/pantry where the needy are served hot meals.
- > The Pittsburgh Ballet Theatre received a grant to support a new production of "The Nutcracker." The production attracts 35,000 people annually, making it the most popular performing arts holiday event in Western Pennsylvania. "The Nutcracker" is also seen by over 41,000 people in cities where it tours. This helps to build future audiences and contributes significantly to the organization's financial stability.
- > A grant given to the Calhoun County Independent School District, located near Alcoa's Point Comfort Operations in Texas, provided teachers with training and materials needed to teach the Modality Math Program to kindergarten students. This program teaches mathematical concepts with hands-on teaching tools, problem solving and partnering with older student "math buddies." While not yet five years old, the children are doing second- and third-grade level math.

As of December 31, 1990, the total market value of Alcoa Foundation's assets was \$232 million, making it the largest permanently funded corporate foundation in the United States.

Shareholder Information

Alcoa's objective is to pay common stock dividends at rates competitive with other investments of equal risk and consistent with the need to reinvest earnings for long-term growth. To support this objective, Alcoa pays a base quarterly dividend and an additional dividend linked directly to the company's financial performance. The base quarterly dividend is 40 cents per common share. The additional dividend is 30% of Alcoa's annual earnings over \$6.00 per share.

Registered owners of Alcoa common and preferred stock can use the company's Dividend Reinvestment and Stock Purchase Plan to purchase common stock shares through automatic dividend reinvestment and/or cash payments. Alcoa pays all service and brokerage charges on purchases. Contact Alcoa's stock record keeper: Pittsburgh National Bank, Stock Transfer Department, 1500 Penn Avenue, Pittsburgh, Pa. 15222 or call (412) 762-3678.

Inquiries about reinvestment and payment of dividends; address corrections; changes of registration; and replacing lost dividend checks, stock certificates or tax forms should be directed to Alcoa's stock record keeper: Pittsburgh National Bank, Stock Transfer Department, 1500 Penn Avenue, Pittsburgh, Pa. 15222 or call (412) 762-3678.

The annual meeting of shareholders is Friday, May 17, 1991 at 9:30 a.m. in the Allegheny Ballroom of the Vista International Hotel in Pittsburgh, Pa.

For copies of annual and quarterly reports, an annual fact book, and Forms 10-K and 10-Q, contact: Financial Communication, 1656 Alcoa Building, Pittsburgh, Pa. 15219 or call (412) 553-4463.

Shareholders with questions on other matters related to Alcoa should contact the Office of the Secretary, 1501 Alcoa Building, Pittsburgh, Pa. 15219 or call (412) 553-4707.

Quarter	1990			1989		
	High	Low	Dividend	High	Low	Dividend
First	\$77½	\$59½	\$1.80	\$65½	\$55½	\$1.52
Second	68½	60½	.40	69½	59½	.40
Third	70½	60½	.45*	77½	63½	.40
Fourth	65	49½	.40	79½	67½	.40
Year	\$77½	\$49½	\$3.05	\$79½	\$55½	\$2.72

* Includes five cents per share for redeeming outstanding rights

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Company Statistics

	Estimated number of shareholders*	Average shares outstanding (000)
1990	56,300	86,204
1989	56,500	88,304
1988	58,400	88,202
1987	52,600	87,671
1986	56,400	84,900

* These estimates include shareholders who own stock registered in their own names and those who own stock through banks and brokers. The estimates do not reflect two employee share ownership plans that no longer exist.

Alcoa
1501 Alcoa Building
Pittsburgh, Pa. 15219
Telephone: (412) 553-4545
Telex: 866470
Facsimile: (412) 553-4498

Aluminum Company of
America is incorporated
in the Commonwealth
of Pennsylvania.

Office of the Secretary
(412) 553-4707

Office of the Treasurer
(412) 553-4705

Common stock:
New York Stock Exchange
and European exchanges
in Basel, Brussels,
Frankfurt, Geneva,
Lausanne, London
and Zurich

Preferred stock:
American Stock Exchange

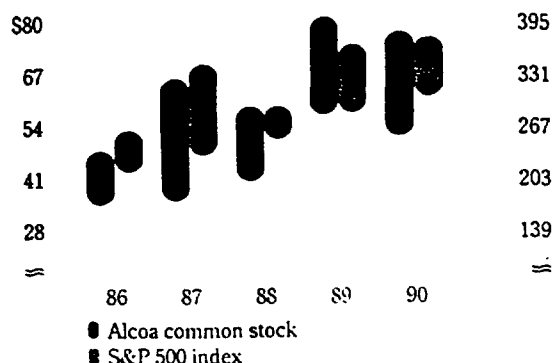
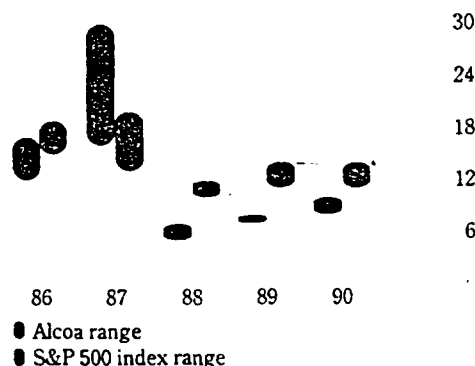
Sinking fund debentures:
New York Stock Exchange

Ticker symbol: AA

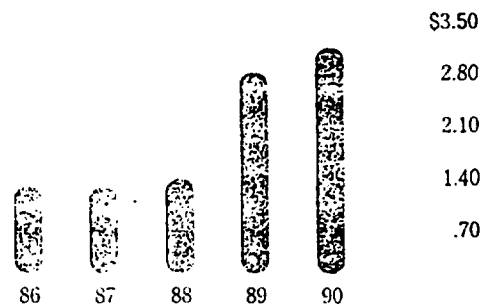
Common stock:
Pittsburgh National Bank
Stock Transfer Department
1500 Penn Avenue
Pittsburgh, Pa. 15222
(412) 762-3678
or
First Chicago Trust Company
of New York
30 West Broadway
New York, N.Y. 10007

Preferred stock:
First Chicago Trust
Company of New York

All issues:
Pittsburgh National Bank
Corporate Trust Department
1500 Penn Avenue
Pittsburgh, Pa. 15222
(412) 762-3828

Trading Ranges of Alcoa Common Stock
vs. S&P 500 IndexPrice/Earnings Ratios of Alcoa
vs. S&P 500 Index

Dividends per Common Share



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