



**NGK INSULATORS, LTD.**

Annual Report 1999

(April 1998 - March 1999)

## PROFILE

With a foundation in exclusive ceramics technology, NGK Insulators, Ltd. supplies markets around the world with a wide range of products and technologies in the “Triple E” growth fields: Energy, Ecology and Electronics.

Based on our “EXCÉL-01” five-year medium-term management plan, which will continue through the fiscal year ending March 2002, we will implement the three key policies of “strategic growth,” “competitive performance,” and “corporate citizenship.” Our aims are to overcome megacompetition by making swift management decisions that respond to changes in the business environment and to develop into a company of excellence with a global business perspective.

# NGK

### ON THE COVER

Soaring transmission tower in Okayama, Japan



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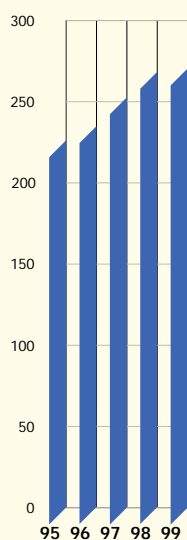
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# FINANCIAL HIGHLIGHTS

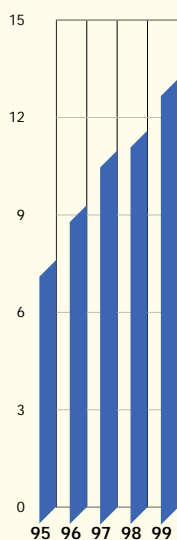
Years Ended March 31

	1999		1998	Percentage Change
	Millions of Yen	Millions of U.S. Dollars	Millions of Yen	
Net Sales .....	<b>¥270,451</b>	<b>\$2,235.1</b>	¥268,080	+0.9
Operating Income .....	<b>27,410</b>	<b>226.5</b>	29,292	-6.4
Net Income .....	<b>13,232</b>	<b>109.4</b>	11,595	+14.1
Total Assets .....	<b>374,409</b>	<b>3,094.3</b>	351,145	+6.6
Total Shareholders' Equity .....	<b>192,364</b>	<b>1,589.8</b>	196,190	-2.0
	Yen	U.S. Dollars	Yen	
Net Income per Share .....	<b>¥36.67/share</b>	<b>\$0.303/share</b>	¥31.97/share	+14.7
Return on Shareholders' Equity .....	<b>6.8%</b>		6.4%	—

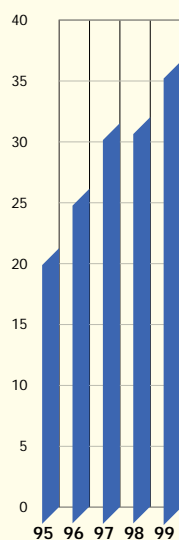
Note: Dollar amounts represent translation of Japanese Yen, for convenience only, at the rate of ¥121=US\$1, the approximate exchange rate on March 31, 1999.



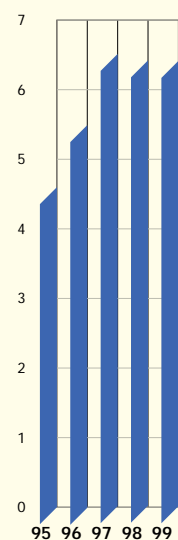
NET SALES  
(Billions of Yen)



NET INCOME  
(Billions of Yen)

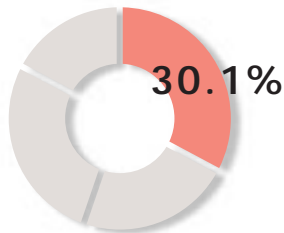


NET INCOME PER SHARE  
(Yen)



RETURN ON SHAREHOLDERS' EQUITY  
(%)

## POWER BUSINESS



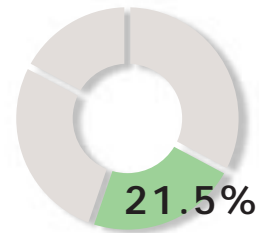
NGK manufactures and markets various types of insulators and equipment to support the stable, high-volume supply of electric power. We have supplied such products worldwide and have won high acclaim. In addition, our global production network now includes the U.S., Belgium, Australia, Indonesia and China. Seven consolidated subsidiaries and two equity-method subsidiaries contribute to consolidated results.

### PRINCIPAL PRODUCTS

This product category includes various types of insulators; equipment for transmission lines, distribution lines, and substations such as bushing shells, fuse-cutout and disconnecting switches; hot-line insulator washing equipment and disaster prevention equipment. The Company has completed R&D for the Sodium Sulfur (NAS) battery, a next-generation efficient power storage system, and is now endeavoring to put it into practical use.



## CERAMIC PRODUCTS BUSINESS



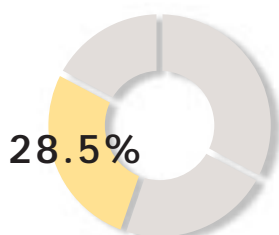
In our mainstay automotive honeycomb ceramics for filtering exhaust emissions, we have responded to worldwide exhaust emission regulations, which have become increasingly strict, resulting in a strong market position. We also supply various products based on applications for fine ceramics technology to a wide range of industries. These include the automotive, chemical, pharmaceutical and construction industries. Eleven consolidated subsidiaries and one equity-method subsidiary contribute to consolidated results.

### PRINCIPAL PRODUCTS

This product category consists of ceramic automotive components, including honeycomb substrates for catalyst converters and diesel particulate filters; industrial apparatus and equipment, such as glass linings, corrosion-resistant pumps and valves, and membrane filters; industrial heating systems and refractories; and measuring instruments.



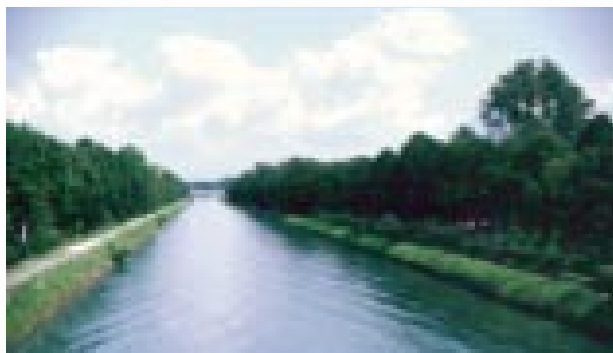
## ENGINEERING BUSINESS



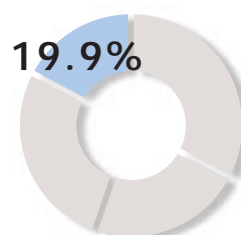
Our water treatment systems, especially sewage treatment systems, have been adopted mainly by governments in major metropolitan areas of Japan and are held in high regard. We also design and construct equipment for low-level radioactive waste treatment. Such equipment is used by nuclear power plants and research facilities. We have also entered into the architectural material business with products such as porcelain-enameled aluminized steel panels. One consolidated subsidiary contributes to consolidated results.

### PRINCIPAL PRODUCTS

The Company designs and constructs water and sewage treatment systems, sewage sludge dewatering equipment and incineration systems, noise-control systems, low-level radioactive waste incineration systems for nuclear power plants and municipal solid waste incineration systems. It also provides architectural products such as porcelain-enameled steel panels.



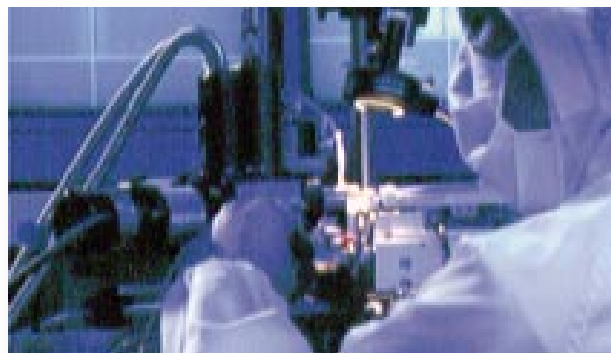
## ELECTRONICS BUSINESS



Our electronic components, which employ fine ceramic and associated technologies, are widely used in the information and communications field, including peripheral equipment for personal computers and optical communications. In addition, our beryllium-copper-wrought products enjoy robust demand as superior materials in such wide-ranging areas as electrical and electronic equipment, automobiles and machinery. Ten consolidated subsidiaries and one equity-method subsidiary contribute to consolidated results.

### PRINCIPAL PRODUCTS

This category consists of electronic components, including ceramic actuators for color printer heads, optoelectronics devices such as optical wave guides, translucent alumina tubes for high-pressure sodium lamps and ceramic products for use in the semiconductor manufacturing process, such as susceptors and dummy wafers; and beryllium products, such as beryllium-copper-wrought products, which are used as high-pressure electricity conductive spring materials, and beryllium metals. Other major products are metal molds primarily used for plastic injection molding and tire manufacturing.



## *O*perational Results

In fiscal 1999, ended March 31, 1999, despite a harsh market environment, NGK Insulators, Ltd. made positive advances in developing new products and expanding sales, which enabled the Company to post a fourth consecutive year of increased sales and a fifth consecutive year of higher net income. Both sales and net income recorded all-time highs for the Company.

Consolidated net sales rose 0.9% from the previous term to ¥270,451 million (US\$2,235.1 million), supported by growth in the engineering and electronics businesses, which offset declines in the power and ceramic products businesses. Reflecting higher research and development (R&D) expenses associated with the active development of new products and the change in product mix, operating income fell 6.4% to ¥27,410 million (US\$226.5 million). However, owing to such factors as a reduction in the corporate tax rate and an improvement in profits and losses by equity method, net income climbed 14.1% to ¥13,232 million (US\$109.4 million). As a result, net income per share grew 14.7% to ¥36.67 (US\$0.303). With the aim of improving the efficiency of equity capital, the Company continued to buy back and retire its own shares. As a result, return on equity (ROE) rose 0.4 percentage point from the previous fiscal year to 6.8%.

This year, we celebrated the Company's 80th anniversary by adding a commemorative year-end cash dividend of ¥1.00 per share, resulting in an annual cash dividend of ¥11.00 per share.

## *C*apital Investment, R&D and Financing

Based on the "EXCÉL-01" medium-term management plan that will continue through the fiscal year ending March 2002, NGK is actively making capital investments aimed at fulfilling its policies of "strategic growth" and achieving "competitive performance" supported by a highly efficient management and financial structure. In the year under review, we implemented

capital investment amounting to approximately ¥26 billion (US\$0.2 billion), an increase of 34.6% from the previous fiscal year, for such projects as the start up of new production bases. In Yamanashi, Japan, we constructed a second manufacturing plant for ceramic products used in color printer heads. In China we set out to produce insulators at our first local plant, and in Indonesia, we launched integrated production of honeycomb ceramics.

We also earmarked 6.6% of total sales for R&D expenses for the year. We plan to continue to engage in a high level of R&D to support the development of new products to be advanced as core businesses in the future.

To finance intensive capital investment and R&D activities, the Company issued unsecured corporate bonds totaling ¥30,000 million in three stages during the year. Each of these received an AA<sup>-</sup> credit rating from Japan Rating and Investment Information, Inc. (R&I), indicating a high regard for the Company's financial position.

## *O*utlook

Fiscal 2000, the fiscal year ending March 31, 2000, marks the third year of our "EXCÉL-01". As we expected, such mature businesses as insulators are suffering from stagnant growth. To ensure we progress under such conditions, we must urgently establish a system to cope rapidly with changes in the operating environment.

In this regard, in April 1999 we brought forward the organizational reforms usually implemented in July. The main feature of these reforms involved the establishment of the Business Incubation Unit (BIU). Rather than relying on existing business classifications, the unit integrates marketing and R&D functions for the purpose of quickly setting up new businesses out of promising R&D themes. We aim to expand operations by cultivating new businesses based on BIU activities. Moreover, we intend to bolster our Company-wide efforts to conserve the environment through the initiatives of our newly



Toshihito Kohara, Chairman of the Board (left)  
Masaharu Shibata, President and Chief Executive Officer (right)

established Environmental Management Department.

At the same time, we intend to maintain our commitment to corporate citizenship. Following the establishment of the “NGK Foundation for International Students” in March 1998, we have been engaged in constructing a foreign student residential hall, “NGK International House,” due to open in October 1999. Through our efforts to become involved in a broader range of philanthropic activities, public relations and investor relations as a sound corporate citizen, we aim to develop into a company known for excellence.

Although the power business will continue to experience challenging conditions in fiscal 2000, we expect other business groups to record solid performance, especially the electronics business, where demand is strong for ceramic products used in color printer heads and semiconductor production equipment.

An increase in the number of consolidated subsidiaries should support an increase in net sales. However, operating income is expected to decline due to the yen’s appreciation and changes in product mix, with net income remaining almost unchanged compared with fiscal 1999. Nevertheless, the effects of measures to streamline production and enhance the efficiency of management should become apparent and we expect new products to generate increased sales. As a result, we aim for

sales and profits to return to a growing trend next fiscal year after bottoming out in the current term.

We ask for the continued support of all our shareholders and investors.

August 1999

Toshihito Kohara  
Chairman of the Board

Masaharu Shibata  
President and Chief Executive Officer

## POWER BUSINESS

Power business sales declined 4.8% from the previous term to ¥81,429 million (US\$673 million). In the domestic market, electric power companies continued to reduce capital investment and cut costs, resulting in overall weaker demand for our insulators and power distribution equipment. A drop in shipments for extra-high-voltage power transmission projects also decreased domestic sales. However, our new Sodium-Sulfur (NAS) batteries for electric power storage recorded increased sales arising from progress in field testing at electric power companies. In the overseas market, demand was lower than in the previous term in such countries as the Philippines and Indonesia, but sales rose on the strength of exports to Saudi Arabia, Egypt and South Korea.

As there is no sign of change in the tendency among electric power companies to curtail capital investment and the power business is expected to face increasingly harsh business environments, we are proceeding to bolster our global manufacturing network for insulators and penetrate further into worldwide markets. In China, NGK Insulators Tangshan Co., Ltd., a joint venture we established to produce insulators for extra-high-voltage power transmission lines, commenced manufacturing and shipping products in September 1998 after completion of a new plant. To improve quality control and maintain its market competitiveness, the company acquired ISO 9001 certification during the year, and will fully enter the Chinese market while working to boost exports to such re-

gions as Southeast Asia and the Middle East.

Our NAS batteries have gone through the R&D stage and are advancing to commercial use. In July 1998, we installed a 500 KW-class system at our headquarters and put it into operation, while demonstrating to power consumers the usefulness of NAS batteries. In March 1999, we also delivered a lower-cost 6 MW-class system, which was developed as a prototype for mass production, to Tokyo Electric Power Company, Inc. (TEPCO) for the Ohito substation in Shizuoka prefecture. To substantially expand sales of NAS batteries, we will further efforts to slash costs and develop new applications.



**NGK Insulators Tangshan in China**  
NGK Insulators Tangshan commenced insulator production with the aim of entering the Chinese market and expanding its exports to the global market.

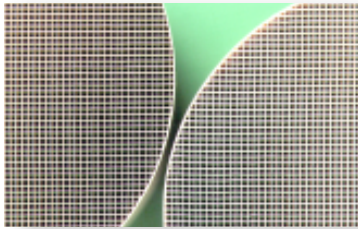


**Lower-cost 6 MW-class NAS battery system (TEPCO's Ohito substation)**  
This prototype displays a 20% improvement in energy density over previous versions.



**ISO/IEC Guide 25 accredited High Voltage Laboratory**  
NGK's High Voltage Laboratory is Japan's first approved laboratory for electrical testing accredited by ISO/IEC Guide 25 international standards.

# CERAMIC PRODUCTS BUSINESS



**Thin-wall honeycomb ceramics**  
Thin-wall honeycomb ceramics can achieve highly efficient filtering of automotive emissions.



**Newly developed metal impregnated C/C composite, "Si-C.C."**  
Due to such characteristics as superior lightness and high elasticity, Si-C.C. is expected to be applied in a wide range of industries.



**P.T. NGK Ceramics Indonesia**  
This manufacturing subsidiary launched integrated production of honeycomb ceramics and continues to expand its facilities with the aim of enlarging production capacity.

Sales in the ceramic products business edged down 0.7% against the previous term to ¥58,166 million (US\$481 million). Honeycomb ceramics for filtering exhaust emissions registered export sales growth supported by buoyant automobile sales in Europe and the United States, while sales rose firmly at our manufacturing subsidiaries in the same regions. However, sales of industrial ceramics and heating systems declined as domestic clients postponed or cancelled their capital investment plans, owing to weak market conditions.

Because of stricter regulations worldwide for automotive exhaust emissions, honeycomb ceramics are expected to enjoy continued steady demand. However, market competition is likely to intensify. To enhance the

competitiveness of our products, we are expanding production of thin-wall honeycomb ceramics that exhibit improved performance in filtering exhaust emissions. Furthermore, as part of efforts to bolster our global production network, P.T. NGK Ceramics Indonesia, our honeycomb ceramics manufacturing subsidiary in Indonesia, commenced integrated production in October 1998 and obtained ISO 9002 certification with the aim of ensuring quality control on a worldwide level. This subsidiary is now preparing to acquire QS-9000 certification.

In new product development, NGK has succeeded in developing a material called "Si-C.C.," which uniformly distributes silicon carbide throughout a C/C (carbon fiber reinforced carbon)

composite by impregnating the C/C composite with metallic silicon. This material not only retains the same properties as C/C composite, which outperforms metallic materials in terms of lightness, durability, elasticity and heat resistance, but also features radically enhanced resistance to corrosion and abrasion. Consequently, it is likely to be used widely as a new industrial material in a variety of fields, including aerospace, semiconductors and industrial equipment.

# ENGINEERING BUSINESS

Sales in our engineering business advanced 6.3% from the previous term to ¥77,185 million (US\$638 million). After receiving abundant orders for water treatment, sludge treatment and municipal solid waste treatment systems in the previous fiscal year, sales increased as deliveries were fully or partially made during the year. This growth also reflected the impact of a large-scale supplementary budget that targeted the sewerage sector as part of the government's comprehensive measures to stimulate the economy. As in the previous term, NGK did not undertake any large-scale projects involving low-level radioactive waste treatment systems. Sales in this product category remained at the same level as the previous term, as revenue came mainly from regular maintenance and upgrading work. Sales of porcelain-enamelled

steel panels declined because of stagnant public- and private-sector construction projects stemming from the prolonged economic downturn in Japan.

NGK has been aiming to enter the market for municipal solid waste treatment by capitalizing on its accumulated expertise in sewage sludge treatment systems. In June 1998, as a first step in this direction, we commenced construction of a plant in Gifu prefecture that will be used for field-testing fluidized bed gasification and melting, a next-generation process for the treatment of municipal solid waste.

In March 1999, we also completed and began operating a refuse derived fuel (RDF) plant, ordered from the joint venture we formed with Recycling Management Japan, Inc., for Shinnanyo Municipality in Yamaguchi prefecture.

The plant has the capacity to treat 48 tons of waste and produce approximately 24 tons of RDF daily. One-third of the RDF produced is used as a source of heat for the drying process performed during RDF production, and the remainder is supplied to local cement factories. In addition, we received an order in conjunction with Kyokuto Kaihatsu Kogyo from the South Ena District Sanitary Affairs Association for a recycling center that retrieves resources from municipal solid waste. This ultramodern recycling facility, which incorporates leading-edge automation and multi-item classification technologies, will be constructed next to the previously mentioned prototype fluidized bed gasification and melting plant. Completion is scheduled by March 2000.



Water purification system (Shiiba, Miyazaki pref.)  
This system achieves advanced water purification by employing NGK's ceramic membranes.



Cylindrical muffler, HISHUT®  
HISHUT® is installed at the top of soundproof walls to enhance the interception of noise.

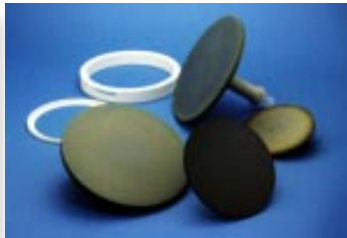


Refuse derived fuel (RDF) plant (Shinnanyo, Yamaguchi pref.)  
NGK has fully entered into the municipal solid waste treatment business, including recycling facilities and RDF plants.

# ELECTRONICS BUSINESS



Yamanashi Plant, the second manufacturing base for ceramic components used in printer heads. Yamanashi Plant will respond to growing demand in the color printer industry.



Ceramic components used in semiconductor production equipment. Anticipating brisk demand arising from increasingly higher levels of semiconductor integration, we bolstered our production facilities for ceramic components.



Opening ceremony for NGK Metals' Sweetwater Plant in U.S.A. We built a new plant for beryllium-copper-wrought products to streamline their production and improve their quality.

Sales in our electronics business rose 4.4% over the previous fiscal year to ¥53,671 million (US\$444 million). Sales of beryllium-copper products surged on the back of vigorous demand in the communications and automobile sectors in Europe and the United States, where strong economic conditions prevailed. Our mold products, however, recorded a decline in sales as demand growth in the domestic automotive industry entered a leveling-off period. In spite of the negative effect from the liquidation of our discrete semiconductor package business, sales of various ceramic products used in the electronics industry grew with higher demand for our new ceramic components used in semiconductor production equipment and stronger sales of actuators for color

ink-jet printer heads.

As our customer, a major manufacturer of printers, is recording buoyant sales, demand in our ceramic products for printer heads is growing. In response, NGK Printer Ceramics Co., Ltd., a subsidiary that manufactures these products, expanded its production capacity by constructing a second plant in Yamanashi Prefecture. The plant began operations in October 1998. Furthermore, we should see a continuing rise in demand for our ceramic components for semiconductor production equipment. Anticipating future recovery of the semiconductor market, we bolstered our production capabilities for these products during the year. As a follow-up to these achievements, we are focusing our efforts on developing

business in glass substrates for computer hard disks. These products, which employ NGK's original crystallized glass, display greater shock resistance and stiffness than conventional aluminum disks. We are striving to ensure they are more widely adopted while concentrating on reducing production costs.

To strengthen our global manufacturing network for beryllium-copper-wrought products, we built a new plant for NGK Metals Corporation in the U.S. State of Tennessee and carried out revisions of that company's production system. These moves are aimed at achieving greater efficiency, lower production costs and improved quality.

## FINANCIAL SECTION

### CONSOLIDATED FIVE-YEAR SUMMARY

Years Ended March 31

	1999		1998	1997	1996	1995
	Millions of Yen	Millions of U.S. Dollars				
Net Sales .....	<b>¥270,451</b>	<b>\$2,235,132</b>	¥268,080	¥252,678	¥234,648	¥226,197
Operating Income .....	<b>27,410</b>	<b>226,529</b>	29,292	25,363	19,635	15,803
Net Income .....	<b>13,232</b>	<b>109,355</b>	11,595	11,024	9,275	7,554
Total Assets .....	<b>374,409</b>	<b>3,094,289</b>	351,145	351,368	347,853	344,537
Total Shareholders' Equity .....	<b>192,364</b>	<b>1,589,785</b>	196,190	167,969	172,416	165,774
Depreciation .....	<b>14,513</b>	<b>119,942</b>	14,111	12,396	11,259	NA
Cash Flow .....	<b>24,037</b>	<b>198,653</b>	22,053	20,210	17,632	NA
Capital Expenditures .....	<b>25,775</b>	<b>213,017</b>	19,151	18,181	12,037	NA
Research and Development Expenses .....	<b>17,820</b>	<b>147,273</b>	17,138	15,952	13,296	14,039
	Yen	U.S. Dollars	Yen			
Net Income per Share .....	<b>¥36.67</b>	<b>\$0.303</b>	¥31.97	¥31.52	¥26.09	¥21.25
Return on Shareholders' Equity .....	<b>6.8%</b>		6.4%	6.5%	5.5%	4.6%
Number of Employees .....	<b>10,538</b>		10,402	10,307	10,638	11,151

Note: Dollar amounts represent translation of Japanese Yen, for convenience only, at the rate of ¥121=U.S.\$1, the approximate exchange rate on March 31, 1999.

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## FINANCIAL REVIEW

### Scope of Consolidation

In accordance with generally accepted accounting principles in Japan, the consolidated financial statements include the accounts of NGK Insulators, Ltd. and 32 consolidated subsidiaries, compared with 30 during the previous term. In addition, there were four associated companies accounted for by the equity method.

### Analysis of Net Sales

Consolidated net sales for the fiscal year ended March 31, 1999, edged up 0.9% to ¥270,451 million (US\$2,235.1 million). Increases in sales of engineering and electronics businesses offset decreases in sales of power and ceramic products businesses. Domestic sales were virtually unchanged at ¥194,636 million (US\$1,608.6 million). Overseas sales increased 3.5% to ¥75,815 million (US\$626.6 million), and the overseas sales ratio increased 0.7 percentage point to 28.0%. North America made up 10.1% of net sales at ¥27,490 million (US\$227.2 million), and Europe accounted

for 7.2% of net sales at ¥19,475 million (US\$161.0 million). Other regions registered ¥28,850 million (US\$238.4 million) in overseas sales, or 10.7% of net sales.

Sales by segment are as follows: power business sales decreased 4.8% to ¥81,429 million (US\$673.0 million), making up 30.1% of net sales; ceramic products business sales declined 0.7% to ¥58,166 million (US\$480.7 million), accounting for 21.5% of net sales, engineering business sales increased 6.3% to ¥77,185 million (US\$637.9 million), representing 28.5% of net sales; and electronics business sales increased 4.4% to ¥53,671 million (US\$443.6 million), or 19.9% of net sales.

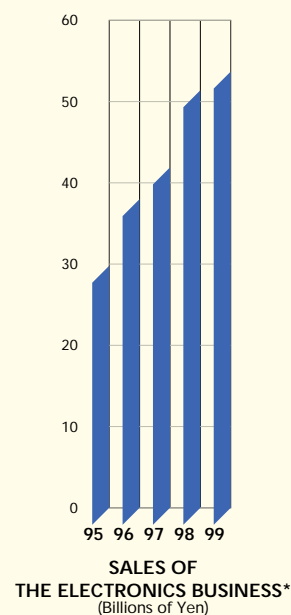
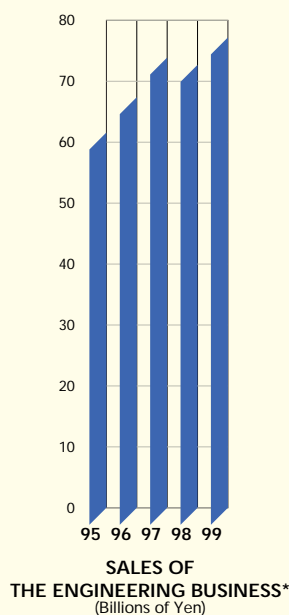
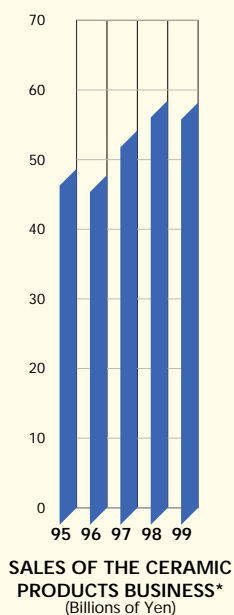
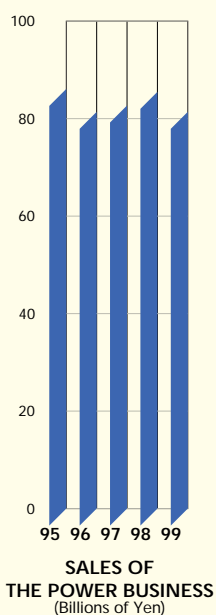
### Analysis of Net Income

Along with the increase of total net sales mentioned above, gross profit inched up to ¥71,047 million (US\$587.2 million) and the ratio of gross profit to sales increased 0.2 percentage point to 26.3%. Selling, general and administrative expenses was

pushed up 7.0% to ¥43,637 million (US\$360.6 million), or 16.1% of net sales, mainly due to the increase of research expenses for new businesses. Total research and development expenses, which are included in operating costs and expenses, increased 4.0% to ¥17,820 million (US\$147.3 million). As a result, operating income declined 6.4% to ¥27,410 million (US\$226.5 million), and the operating income margin decreased 0.8 percentage point to 10.1%.

Interest expense net of interest and dividend income was ¥720 million (US\$6.0 million), an increase of ¥309 million (US\$2.6 million), while write-down of securities decreased ¥541 million (US\$4.5 million) to ¥56 million (US\$0.5 million). As a result, net other expenses was ¥2,942 million (US\$24.3 million), an improvement of 13.4% compared with the previous fiscal year.

The above factors led to income before income taxes and minority interests of ¥24,468 million (US\$202.2 million). The



\*See note at the bottom of page 25.

effective tax rate declined 8.4 percentage points to 45.5%. Net income rose 14.1% to ¥13,232 million (US\$109.4 million), supported mainly by the reduction of the Japanese corporate tax rate. Net income per share increased from ¥31.97 to ¥36.67 (US\$0.303).

### Analysis of Cash Flows and Financial Position

Net cash provided by operating activities fell 66.0% to ¥12,238 million (US\$101.1 million), including a loss registered in notes and accounts receivable of ¥16,128 million (US\$133.3 million), compared with a gain of ¥8,970 million in the previous year. Net cash used in investing activities soared 48.7% to ¥32,154 million (US\$265.7 million). The primary reasons for this rise include a substantial increase in acquisitions of marketable securities and acquisitions of property, plant and equipment, which more than offset an increase in proceeds from sales and redemption of market-

able securities.

Capital expenditures soared 34.6% to ¥25,775 million (US\$213.0 million). All segments recorded a rise in capital expenditures with the exception of the power business segment, which was down slightly. Major applications of investment included the construction of a second manufacturing plant for ceramic products used in color printer heads, the start-up of insulator production in China and the integrated production of honeycomb ceramics in Indonesia.

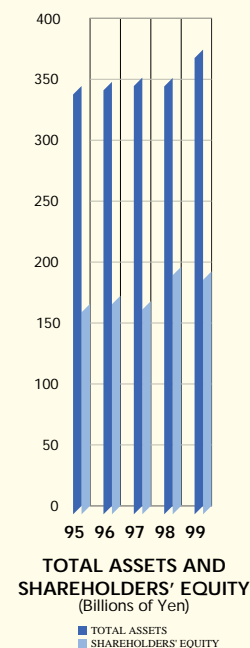
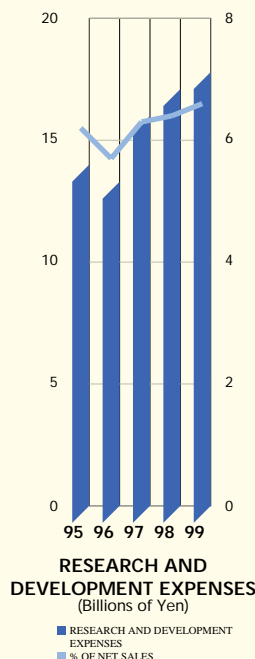
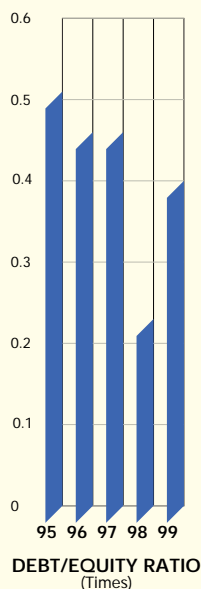
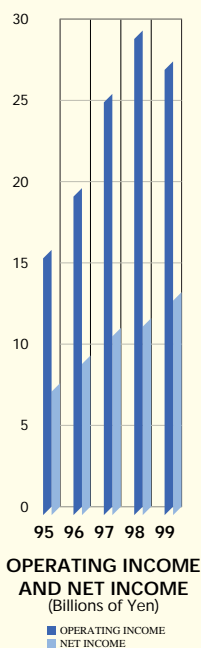
Net cash provided by financing activities amounted to ¥14,983 million (US\$123.8 million), compared with net cash used in financing activities of ¥15,139 million in the previous year. The factor behind this change was proceeds from issuance of bonds of ¥30,000 million (US\$247.9 million), which surpassed the largest use of cash in this category of ¥13,356 million (US\$110.4 million) for payments to acquire treasury stock for retirement.

In aggregate, there was a net decrease in cash and cash equivalents of ¥5,137 million (US\$42.5 million), and cash and cash equivalents at end of year were ¥25,354 million (US\$209.5 million).

Interest-bearing debt (defined as short-term borrowings, the current portion of long-term debt and long-term debt) climbed 70.3% to ¥77,428 million (US\$639.9 million). The largest factor in this increase was the issuance of ¥30,000 million in unsecured yen bonds.

Total shareholders' equity decreased 2.0% to ¥192,364 million (US\$1,589.8 million) due to a reduction in retained earnings as a result of the retirement of treasury stock, and the equity ratio declined 4.5 percentage points to 51.4%.

Return on average assets was 3.6% and return on average equity (ROE) was 6.8%, compared with the previous term's levels of 3.3% and 6.4%, respectively.





NGK Insulators, Ltd. and Consolidated Subsidiaries  
**CONSOLIDATED BALANCE SHEETS**  
 March 31, 1999 and 1998

	Millions of Yen		Thousands of U.S. Dollars (Note 1)
	1999	1998	1999
<b>ASSETS</b>			
<b>Current Assets:</b>			
Cash and cash equivalents .....	¥ 25,354	¥ 28,531	\$ 209,537
Marketable securities (Note 4) .....	31,861	24,297	263,314
Notes and accounts receivable:			
Trade notes and accounts .....	104,622	89,045	864,645
Non-consolidated subsidiaries and associated companies .....	3,785	4,363	31,281
Allowance for doubtful accounts .....	(548)	(450)	(4,529)
	<b>107,859</b>	<b>92,958</b>	<b>891,397</b>
Inventories (Note 5) .....	40,678	39,959	336,182
Cost of contracts in progress .....	2,488	3,583	20,562
Prepaid expenses and other current assets .....	3,951	8,308	32,653
Total current assets .....	<b>212,191</b>	<b>197,636</b>	<b>1,753,645</b>
<b>Property, Plant and Equipment:</b>			
Buildings and structures .....	70,805	66,004	585,165
Machinery and equipment .....	159,766	151,608	1,320,380
	<b>230,571</b>	<b>217,612</b>	<b>1,905,545</b>
Accumulated depreciation .....	(144,620)	(139,046)	(1,195,206)
	<b>85,951</b>	<b>78,566</b>	<b>710,339</b>
Construction in progress .....	4,870	3,706	40,248
Land .....	20,243	19,652	167,297
Net property, plant and equipment .....	<b>111,064</b>	<b>101,924</b>	<b>917,884</b>
<b>Investments and Other Assets:</b>			
Investment securities (Note 4) .....	18,924	17,772	156,397
Investments in and loans to non-consolidated subsidiaries and associated companies .....	18,054	22,028	149,206
Foreign currency statements translation adjustments .....	8,489	6,651	70,157
Other assets .....	5,687	5,134	47,000
Total investments and other assets .....	<b>51,154</b>	<b>51,585</b>	<b>422,760</b>
<b>TOTAL .....</b>	<b>¥ 374,409</b>	<b>¥ 351,145</b>	<b>\$ 3,094,289</b>

See notes to consolidated financial statements.

	Millions of Yen		Thousands of U.S. Dollars (Note 1)
	1999	1998	1999
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>			
<b>Current Liabilities:</b>			
Short-term borrowings (Note 6) .....	¥ 4,741	¥ 3,525	\$ 39,182
Current portion of long-term debt (Note 6) .....	195	455	1,612
Notes and accounts payable:			
Trade notes and accounts .....	42,526	41,273	351,454
Non-consolidated subsidiaries and associated companies .....	3,487	4,357	28,818
Other .....	8,215	8,240	67,893
	54,228	53,870	448,165
Accrued expenses .....	12,048	11,971	99,570
Income taxes payable .....	5,528	9,436	45,686
Advances received .....	1,974	3,007	16,314
Other current liabilities .....	1,765	1,096	14,587
Total current liabilities .....	80,479	83,360	665,116
<b>Long-Term Liabilities:</b>			
Long-term debt (Note 6) .....	72,492	41,487	599,107
Liability for severance indemnities (Note 7) .....	20,985	21,834	173,430
Other long-term liabilities .....	4,477	5,279	37,000
Total long-term liabilities .....	97,954	68,600	809,537
Minority Interests in Consolidated Subsidiaries .....	3,612	2,995	29,851
<b>Contingent Liabilities (Note 12)</b>			
<b>Shareholders' Equity (Note 8):</b>			
Common stock:			
Authorized—770,000 thousand shares at March 31, 1999 780,000 thousand shares at March 31, 1998			
Issued, par value ¥50 per share—354,323 thousand shares and 364,322 thousand shares at March 31, 1999 and 1998, respectively .....	49,460	49,459	408,760
Additional paid-in capital .....	64,750	64,749	535,124
Retained earnings .....	78,157	81,986	645,926
Less: Treasury stock .....	(3)	(4)	(25)
Total shareholders' equity .....	192,364	196,190	1,589,785
<b>TOTAL .....</b>	<b>¥374,409</b>	<b>¥351,145</b>	<b>\$3,094,289</b>

**CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY**

Years Ended March 31, 1999 and 1998

	Number of Outstanding Common Shares (Thousands)	Millions of Yen		
		Common Stock	Additional Paid-in Capital	Retained Earnings
<b>BALANCE AT APRIL 1, 1997</b> .....	345,466	¥ 33,040	¥ 48,330	¥ 86,601
Net income .....	—	—	—	11,595
Cash dividends, interim and year-end .....	—	—	—	(3,571)
Bonuses to directors and corporate auditors .....	—	—	—	(82)
Adjustment due to change in scope of consolidation .....	—	—	—	(756)
Shares issued on exercise of warrants .....	28,856	16,419	16,419	—
Retirement of treasury stock (Note 8) .....	(10,000)	—	—	(11,801)
<b>BALANCE AT MARCH 31, 1998</b> .....	364,322	¥ 49,459	¥ 64,749	¥ 81,986
Net income .....	—	—	—	13,232
Cash dividends, interim and year-end .....	—	—	—	(3,626)
Bonuses to directors and corporate auditors .....	—	—	—	(82)
Adjustment due to change in scope of consolidation .....	—	—	—	3
Conversion of convertible bonds .....	1	1	1	—
Retirement of treasury stock (Note 8) .....	(10,000)	—	—	(13,356)
<b>BALANCE AT MARCH 31, 1999</b> .....	<b>354,323</b>	<b>¥ 49,460</b>	<b>¥ 64,750</b>	<b>¥ 78,157</b>

	Thousands of U.S. Dollars (Note 1)		
	Common Stock	Additional Paid-in Capital	Retained Earnings
<b>BALANCE AT MARCH 31, 1998</b> .....	\$408,752	\$535,116	\$ 677,570
Net income .....	—	—	109,355
Cash dividends, interim and year-end .....	—	—	(29,967)
Bonuses to directors and corporate auditors .....	—	—	(677)
Adjustment due to change in scope of consolidation .....	—	—	25
Conversion of convertible bonds .....	8	8	—
Retirement of treasury stock (Note 8) .....	—	—	(110,380)
<b>BALANCE AT MARCH 31, 1999</b> .....	<b>\$408,760</b>	<b>\$535,124</b>	<b>\$ 645,926</b>

See notes to consolidated financial statements.

NGK Insulators, Ltd. and Consolidated Subsidiaries  
**CONSOLIDATED STATEMENTS OF CASH FLOWS**  
Years Ended March 31, 1999 and 1998

	Millions of Yen		Thousands of U.S. Dollars (Note 1)
	1999	1998	1999
<b>Operating Activities:</b>			
Net income .....	¥13,232	¥ 11,595	\$ 109,355
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization .....	14,513	14,111	119,942
Loss on sale and disposal of property, plant and equipment .....	1,132	1,197	9,355
Write-down/write-off of investments in non-consolidated subsidiaries .....	768	—	6,347
Reversal of severance indemnities, net of provision .....	(848)	(91)	(7,008)
Write-down of securities .....	56	597	463
Gain on sales of securities .....	(958)	(79)	(7,917)
Amortization of deferred translation gain .....	—	(59)	—
Equity in losses of non-consolidated subsidiaries and associated affiliates .....	515	1,408	4,256
Others .....	(94)	(153)	(777)
Changes in assets and liabilities:			
Notes and accounts receivable .....	(16,128)	8,970	(133,289)
Cost of contracts in progress .....	1,095	1,130	9,050
Inventories .....	(1,852)	(1,692)	(15,306)
Other current assets .....	4,493	164	37,132
Notes and accounts payable .....	1,536	(244)	12,694
Income taxes payable .....	(3,767)	(1,360)	(31,132)
Accrued expenses and other current liabilities .....	(1,455)	482	(12,025)
Net cash provided by operating activities .....	<b>12,238</b>	<b>35,976</b>	<b>101,140</b>
<b>Investing Activities:</b>			
Acquisition of property, plant and equipment .....	(25,775)	(19,151)	(213,016)
Proceeds from sales of property, plant and equipment .....	1,322	346	10,926
Acquisition of marketable securities .....	(29,931)	(11,680)	(247,364)
Proceeds from sales and redemption of marketable securities .....	23,322	14,276	192,744
Acquisition of investment securities .....	(1,228)	(4,654)	(10,149)
Proceeds from sales of investment securities .....	24	486	198
Net (increase) decrease in:			
Investments in and loans to non-consolidated subsidiaries and associated companies .....	(388)	(1,754)	(3,207)
Other assets .....	500	511	4,132
Net cash used in investing activities .....	<b>(32,154)</b>	<b>(21,620)</b>	<b>(265,736)</b>
<b>Financing Activities:</b>			
Increase in long-term borrowings .....	373	74	3,083
Increase (Decrease) in short-term borrowings .....	1,624	(279)	13,421
Proceeds from issuance of bonds .....	30,000	—	247,934
Repayment of long-term debt .....	(459)	(32,400)	(3,792)
Shares issued on exercise of warrants .....	—	32,837	—
Subscription proceeds from minority shareholders .....	427	—	3,529
Payments to acquire treasury stock for retirement .....	(13,356)	(11,800)	(110,380)
Cash dividends .....	(3,626)	(3,571)	(29,967)
Net cash provided by (used in) financing activities .....	<b>14,983</b>	<b>(15,139)</b>	<b>123,828</b>
Effect of exchange rate changes on cash and cash equivalents .....	(204)	—	(1,686)
<b>Net Decrease in Cash and Cash Equivalents</b> .....	<b>(5,137)</b>	<b>(783)</b>	<b>(42,454)</b>
<b>Cash and Cash Equivalents of Newly Consolidated Subsidiaries at Beginning of Year</b> .....	<b>1,960</b>	<b>952</b>	<b>16,198</b>
<b>Cash and Cash Equivalents at Beginning of Year</b> .....	<b>28,531</b>	<b>28,362</b>	<b>235,793</b>
<b>Cash and Cash Equivalents at End of Year</b> .....	<b>¥ 25,354</b>	<b>¥ 28,531</b>	<b>\$ 209,537</b>
<b>Additional Cash Flow Information:</b>			
Cash paid during the year for:			
Interest .....	¥ 2,389	¥ 2,521	\$ 19,744
Income taxes .....	15,031	15,151	124,223
<b>Noncash Investing and Financing Activities:</b>			
Convertible bonds converted into common stock .....	¥ 2	¥ —	\$ 17
Assets increased by consolidation of subsidiaries previously unconsolidated .....	5,836	4,088	48,231
Liabilities increased by consolidation of subsidiaries previously unconsolidated .....	924	2,413	7,636

See notes to consolidated financial statements.

## 1. BASIS OF PRESENTING CONSOLIDATED FINANCIAL STATEMENTS

The accompanying consolidated financial statements have been prepared from accounts and records maintained by NGK INSULATORS, LTD. (the "Company"), and its domestic and foreign consolidated subsidiaries (together, referred to as the "Companies") in accordance with the provisions set forth in the Japanese Securities and Exchange Law, and in conformity with accounting principles and practices generally accepted in Japan, which are different in certain respects as to application and disclosure requirements of International Accounting Standards. The accounts and records of foreign consolidated subsidiaries are maintained in conformity with accounting principles of the countries of their domicile. The consolidated statements of cash flows are not required as part of the basic financial statements in Japan but are presented herein as additional information. The accompanying consolidated financial statements are not intended to present the financial position, results of operations, and cash flows in accordance with accounting principles and practices generally

accepted in countries and jurisdictions other than Japan.

In preparing these consolidated financial statements, certain reclassifications and rearrangements have been made to the consolidated financial statements issued domestically in order to present them in a form, which is more familiar to readers outside Japan. In addition, certain reclassifications have been made in the 1998 consolidated financial statements to conform to the classifications used in 1999.

The consolidated financial statements are stated in Japanese yen, the currency of the country in which the Company is incorporated and operates. The translations of Japanese yen amounts into U.S. dollar amounts are included solely for the convenience of readers outside Japan and have been made at the rate of ¥121 to \$1, the approximate rate of exchange at March 31, 1999. Such translations should not be construed as representations that the Japanese yen amounts could be converted into U.S. dollars at that or any other rate.

## 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### (a) Consolidation

The consolidated financial statements as of March 31, 1999 include the accounts of the Company and its significant 32 (30 in 1998) majority-owned subsidiaries. Investments in 4 associated companies (companies owned 20% to 50%) are accounted for by the equity method. Investments in other subsidiaries and associated companies are stated at cost. If the equity method of accounting had been applied to the investments in these companies, the effect on the accompanying consolidated financial statements would not have been material.

The excess of the equity in net assets acquired at the respective dates of acquisition over cost of investments in consolidated subsidiaries and associated companies accounted for by the equity method, is being amortized over a period of five years.

All significant intercompany balances and transactions have been eliminated in consolidation. All material unrealized profit included in assets resulting from transactions within the Companies has also been eliminated.

The fiscal years of the subsidiaries are not necessarily the same as the Company's. Accounts of those subsidiaries, which have different fiscal periods, have been adjusted for significant transactions to reflect properly their financial positions at March 31 of each year and the results of operations for the years then ended.

### (b) Cash and Cash Equivalents

For statements of cash flows purposes, the Company considers all highly liquid debt instruments with original maturities of three months or less to be cash equivalents.

### (c) Inventories

Inventories are stated at cost, determined principally by the average method. Certain consolidated subsidiaries determine cost by the retail method.

### (d) Marketable and Investment Securities

Listed securities included in marketable and investment securities are principally stated at the lower of cost or market, cost being determined by the moving-average method. Other securities are principally stated at cost, determined by the moving-average method.

### (e) Property, Plant and Equipment

Property, plant and equipment are stated at cost. Depreciation of property, plant and equipment is computed mainly by the declining-balance method except for buildings, whose depreciation is computed by the straight-line method, at rates based on the estimated useful lives of the assets. Certain consolidated subsidiaries utilize the straight-line method. The range of useful lives is principally from 3 to 50 years (3 to 65 years in 1998) for buildings and structures and from 2 to 17 years for machinery, equipment, furniture and tools. The effects of the change in useful lives of buildings were to increase depreciation expense by ¥183 million (\$1,512 thousand), and to decrease operating income and income before income taxes and minority interests by ¥171 million (\$1,413 thousand), respectively. The related effects on segment information are disclosed in Note 14.

### (f) Other Assets

Research and development costs are mainly charged to income as incurred. Certain overseas subsidiaries defer development costs and amortize such costs over 5 years.

Stock issuance costs and bond issuance costs are charged to income as incurred.

### (g) Liability for Severance Indemnities and Retirement Benefits

The annual provision for employees' retirement benefits is primarily calculated to state the liability for the amount required to be paid if all employees voluntarily terminated their

employment at each balance sheet date, less amounts funded by a contributory pension plan (which covers a portion equal to 77% (70% in 1998) of the total benefits for the Company) and amounts funded by non-contributory pension plans for certain subsidiaries.

The prior service cost for adopting the Company's contributory pension plan on April 1, 1991, was recalculated during the year ended March 31, 1996, and is amortized over 10 years starting for the year ended March 31, 1996. The excess of liability for severance indemnities for the Company is being reversed over the same period.

The excess of liability for severance indemnities for the Company, resulting from the increase in coverage by contributory pension plan effective from April 1, 1998, is reversed over 10 years.

Retirement benefits for directors and corporate auditors for the Company and certain subsidiaries are provided at the amount that would be paid if they retired at each balance sheet date.

#### **(h) Postretirement Benefits**

Two U.S. subsidiaries provide certain health care and life insurance benefits for their retired employees. Substantially all of the subsidiaries' employees may become eligible for these benefits depending on years of service. Statement of Financial Accounting Standards No. 106 requires the subsidiaries to recognize the cost of postretirement benefits other than pensions on an accrual basis as employees perform the services to earn the benefits.

#### **(i) Leases**

All leases for the Company and domestic subsidiaries are accounted for as operating leases. Under Japanese accounting standards for leases, finance leases that deem to transfer ownership of the leased property to the lessee are to be capitalized, while other finance leases are permitted to be accounted for as operating lease transactions if certain "as if capitalized" information is disclosed in the notes to the lessee's financial statements. These standards are being applied on a step-by-step basis beginning with fiscal years starting on or after April 1, 1996, with full implementation expected for fiscal years starting on or after April 1, 1998. The Company completed implementation of these standards during the year ended March 31, 1999.

#### **(j) Income Taxes**

The Company and domestic subsidiaries provide for income taxes at the amount currently payable for each year. The tax

effect of temporary differences between tax and financial reporting purposes is not recorded. Certain overseas subsidiaries provide for deferred income taxes relating to temporary differences in accordance with accounting principles generally accepted in the relevant countries.

#### **(k) Appropriation of Retained Earnings**

Appropriations of retained earnings at each year-end are reflected in the financial statements for the following year upon shareholders' approval.

#### **(l) Foreign Currency Transactions**

Short-term receivables and payables denominated in foreign currencies are translated into Japanese yen at the current exchange rates at each balance sheet date. Long-term receivables and payables denominated in foreign currencies are generally translated into Japanese yen at historical exchange rates. In such case as there is a significant fluctuation of currencies with possible exchange losses, long-term receivable or payables denominated in foreign currencies are translated at the current exchange rates as of each balance sheet date.

#### **(m) Foreign Currency Financial Statements**

The balance sheet accounts of the consolidated overseas subsidiaries are translated into yen at the current exchange rates as of the balance sheet date except for shareholder's equity, which is translated at the historical exchange rate. Differences arising from such translation are shown as "Foreign currency statements translation adjustments" in the accompanying consolidated balance sheets. Revenue and expense accounts of the consolidated overseas subsidiaries are translated into yen at average rates.

#### **(n) Per Share Information**

The computation of net income per share is based on the weighted average number of shares of common stock outstanding during each year, retroactively adjusted for stock splits. The average number of common shares used in the computation were 360,796 and 362,717 thousand shares for 1999 and 1998, respectively.

Diluted net income per share of common stock assumes full conversion of the outstanding convertible bonds at the beginning of the year (or at the time of issuance) with an applicable adjustment for related interest expense, net of tax.

Cash dividends per share presented in the accompanying consolidated statements of income are dividends applicable to the respective years including dividends to be paid after the end of the year.

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### **3. ACCOUNTING CHANGE**

Effective April 1, 1998, the Company adopted the straight-line method of depreciation for buildings, which, previously, had been depreciated by the declining-balance method. The effects of this change were to decrease depreciation expense by ¥749 million (\$6,190 thousand), and to increase operating

income and income before income taxes and minority interests by ¥704 million (\$5,818 thousand) for the year ended March 31, 1999. The related effects on segment information are disclosed in Note 14.

#### 4. MARKETABLE AND INVESTMENT SECURITIES

Marketable and investment securities at March 31, 1999 and 1998, consisted of the following:

	Millions of Yen		Thousands of U.S. Dollars
	1999	1998	1999
<b>Current:</b>			
Marketable equity securities .....	¥ 2,885	¥ 2,752	\$ 23,843
Government and corporate bonds .....	9,716	8,283	80,297
Others .....	19,260	13,262	159,174
Total .....	¥31,861	¥24,297	\$263,314
<b>Non-current:</b>			
Marketable equity securities .....	¥18,920	¥17,769	\$156,364
Others .....	4	3	33
Total .....	¥18,924	¥17,772	\$156,397

Carrying amounts and aggregate market values of current and non-current marketable securities included in marketable and investment securities at March 31, 1999 and 1998, were as follows:

	Millions of Yen		Thousands of U.S. Dollars
	1999	1998	1999
<b>Current:</b>			
Carrying amount .....	¥ 7,618	¥ 8,903	\$ 62,959
Aggregate market value .....	12,708	15,206	105,025
Unrealized gain .....	¥ 5,090	¥ 6,303	\$ 42,066
<b>Non-current:</b>			
Carrying amount .....	¥12,827	¥11,775	\$106,008
Aggregate market value .....	74,212	73,427	613,322
Unrealized gain .....	¥61,385	¥61,652	\$507,314

Investment trusts, unlisted foreign bonds, money management funds, and unlisted shares, except for over-the-counter shares for which there is no readily-available market from which to obtain or calculate the market value thereof, are excluded from the above information.

#### 5. INVENTORIES

Inventories at March 31, 1999 and 1998, consisted of the following:

	Millions of Yen		Thousands of U.S. Dollars
	1999	1998	1999
Finished products .....	¥17,741	¥18,094	\$146,620
Semi-finished products .....	6,492	6,132	53,653
Work-in-process .....	5,455	5,681	45,083
Raw materials .....	7,000	6,626	57,851
Supplies .....	3,990	3,426	32,975
Total .....	¥40,678	¥39,959	\$336,182

## 6. SHORT-TERM BORROWINGS AND LONG-TERM DEBT

Short-term borrowings at March 31, 1999 and 1998, consisted mainly of notes to banks. The annual interest rates applicable to short-term borrowings ranged from 1.375% to 7.25% and 1.16% to 7.20% at March 31, 1999 and 1998, respectively.

Long-term debt at March 31, 1999 and 1998, consisted of the following:

	Millions of Yen		Thousands of U.S. Dollars
	1999	1998	1999
Borrowings from banks and other financial institutions .....	¥ 1,826	¥ 1,079	\$ 15,092
Unsecured 4.5% yen convertible bonds due September 29, 2000 ....	40,861	40,863	337,695
Unsecured 2.675% yen bonds due April 21, 2008 .....	10,000	—	82,644
Unsecured 1.875% yen bonds due April 21, 2003 .....	10,000	—	82,644
Unsecured 1.6% yen bonds due October 6, 2005 .....	10,000	—	82,644
Total .....	72,687	41,942	600,719
Less: Portion due within one year .....	(195)	(455)	(1,612)
Long-term debt, less current portion .....	¥72,492	¥41,487	\$599,107

Additional information with respect to the Company's convertible bonds is as follows:

4.5% Yen Convertible Bonds	
Issued	August 1991
Initial principal amount	¥45,000 million
Type of issue	Public
Due	September 2000
Terms of conversion period	From September 1991 to September 2000
Conversion price (per share *) as of March 31, 1999	¥ 1,095.90
Balance of debt securities as of March 31, 1999	¥ 40,861 million
Accumulated number of shares issued upon conversion until March 31, 1999	5 thousand shares
Number of shares which would be issued upon full conversion as of March 31, 1999	37,285 thousand shares

\*Subject to adjustments for subsequent stock splits and other circumstances.

Annual maturity amounts of long-term debt at March 31, 1999, were as follows:

Year ending March 31,	Millions of Yen		Thousands of U.S. Dollars
	1999	1998	1999
2000 .....	¥ 195		\$ 1,612
2001 .....	41,009		338,917
2002 .....	167		1,380
2003 .....	266		2,198
2004 and thereafter .....	31,050		256,612
Total .....	¥72,687		\$610,719

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## 7. LIABILITY FOR SEVERANCE INDEMNITIES AND RETIREMENT BENEFITS

The Company's contributory funded pension plan (the "Plan") covers 77% (70% in 1998) of the retirement benefits payable if all employees voluntarily terminated their employment. The amount of such retirement benefits is determined by reference to the latest rate of pay, length of service and conditions under which retirement occurs. Eligible retirees for the Plan are those who have been employed for 8 years or more. The balance of the fund at March 31, 1998 (the most recent date of available information), was ¥35,067 million (\$289,810 thousand).

The liability for severance indemnities in the accompanying consolidated balance sheets includes a portion of retire-

ment benefits for employees which is not covered by the Plan.

Total charges to income for retirement benefits were ¥3,349 million (\$27,678 thousand) and ¥3,352 million for the years ended March 31, 1999 and 1998, respectively.

The liability for severance indemnities in the accompanying consolidated balance sheets also includes retirement benefits for directors and corporate auditors of ¥1,273 million (\$10,521 thousand) and ¥1,207 million at March 31, 1999 and 1998, respectively. The retirement benefits for directors and corporate auditors are paid subject to approval by the shareholders.

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## 8. SHAREHOLDERS' EQUITY

The Japanese Commercial Code (the "Code") requires at least 50% of the issue price of new shares, with a minimum of the par value thereof, to be designated as stated capital as determined by a resolution of the Board of Directors. Proceeds in excess of amounts designated as stated capital are credited to additional paid-in capital.

The Company may transfer portions of additional paid-in capital to stated capital by a resolution of the Board of Directors. The Company may also transfer portions of unappropriated retained earnings, available for dividends, to stated capital by a resolution of the shareholders.

Under the Code, the Company may issue new common shares to existing shareholders without consideration as a stock split pursuant to a resolution of the Board of Directors. The Company may make such a stock split to the extent that the aggregate par value of the shares outstanding after the stock split does not exceed the stated capital. However, the amount calculated by dividing the total amount of shareholders' equity by the number of outstanding shares after the stock split can not be less than ¥50.

Dividends are approved by the shareholders at a meeting

held subsequent to the fiscal year to which the dividends are applicable. Semi-annual interim dividends may also be paid upon a resolution of the Board of Directors. Under the Code, the amount available for dividends is based on retained earnings as recorded on the Company's books. At March 31, 1999, the amount available for dividends was ¥56,351 million (\$465,711 thousand).

During the year ended March 31, 1998, the Company purchased 10,000 thousand shares of its common stock for ¥11,800 million for the retirement of such capital stock, pursuant to shareholders' approval at their June 27, 1997 meeting. The Company retired this treasury stock by retained earnings decreasing the number of shares authorized and issued by 10,000 thousand shares.

During the year ended March 31, 1999, the Company purchased 10,000 thousand shares of its common stock for ¥13,356 million (\$110,380 thousand) for the retirement of such capital stock, pursuant to shareholders' approval at their June 26, 1998 meeting. The Company retired this treasury stock by retained earnings decreasing the number of shares authorized and issued by 10,000 thousand shares.

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## 9. INCOME TAXES

The Company and its domestic subsidiaries are subject to Japanese national and local taxes based on income which, in the aggregate, resulted in normal effective statutory tax rates of approximately 48% and 51% for 1999 and 1998, respectively. Foreign subsidiaries are subject to income taxes of the countries in which they operate. The actual effective tax rates in

the accompanying consolidated statements of income differed from the normal effective statutory rates due principally to (1) non-recognition of the tax effects of temporary differences between tax and financial reporting and (2) certain expenses that are permanently non-deductible for tax purposes.

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## 10. RESEARCH AND DEVELOPMENT COSTS

Research and development costs charged to income were ¥17,820 million (\$147,273 thousand) and ¥17,138 million for the years ended March 31, 1999 and 1998, respectively.

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## 11. LEASES

The Company and certain subsidiaries lease mainly machinery and equipment. Related lease payments for the years ended March 31, 1999 and 1998, were ¥340 million (\$2,810 thousand) and ¥448 million, respectively.

Pro forma information of leased property such as acquisition cost, accumulated depreciation, obligations under finance leases, and depreciation expense of finance leases that do not transfer ownership of the property to the leasee on an "as if capitalized" basis was as follows:

March 31, 1999 (¥):	Millions of Yen		
	Machinery and Equipment	Others	Total
Acquisition cost .....	¥ 1,278	¥ 230	¥ 1,508
Accumulated depreciation .....	839	89	928
Net leased property .....	¥ 439	¥ 141	¥ 580

March 31, 1999 (\$):	Thousands of U.S. Dollars		
	Machinery and Equipment	Others	Total
Acquisition cost .....	\$10,562	\$1,901	\$12,463
Accumulated depreciation .....	6,934	736	7,670
Net leased property .....	\$ 3,628	\$1,165	\$ 4,793

Obligations under finance leases as of March 31, 1999 and 1998, were as follows:

	Millions of Yen		Thousands of U.S. Dollars
	1999	1998	1999
Due within one year .....	<b>¥246</b>	¥312	<b>\$2,033</b>
Due after one year .....	<b>334</b>	438	<b>2,760</b>
Total .....	<b>¥580</b>	¥750	<b>\$4,793</b>

The amounts of acquisition cost and obligations under finance leases include the imputed interest expense portion.

Depreciation expense, which is not reflected in the accompanying consolidated statements of income for the year ended March 31, 1999, computed by the straight-line method, was ¥340 million (\$2,810 thousand).

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## 12. CONTINGENT LIABILITIES

At March 31, 1999, the Company had contingent liabilities for notes discounted by banks in the aggregate amount of ¥170 million (\$1,405 thousand), and guarantees of bank borrowings of non-consolidated and associated companies, employees, and others in the aggregate amount of ¥4,335 million (\$35,826 thousand).

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## 13. DERIVATIVES

The Company enters into foreign exchange forward contracts, interest rate swaps, interest rate swaptions and interest rate caps contracts. These foreign exchange forward contracts are entered into to hedge foreign exchange risk related to receivables and payables denominated in foreign currencies. These interest rate swaps, interest rate swaptions, and interest rate caps contracts are entered into as a means of managing the interest rate risk for the 4.5% yen convertible bonds due 2000, unsecured 2.675% yen bonds due 2008, unsecured 1.875% yen bonds due 2003, and unsecured 1.6% yen bonds due 2005. Interest rate cap contracts are entered into to hedge the interest rate risk associated with interest rate swap contracts due to interest rate fluctuations.

The Company does not hold or issue derivatives for trading purposes.

The Company does not anticipate any loss arising from credit risk as the counterparties to those derivatives are limited to major international financial institutions.

The Company strictly controls derivative transactions in accordance with internal policies which require approval and reporting for all derivative transactions.

The Company's derivative contracts which were not reflected in the consolidated balance sheets at March 31, 1999 and 1998, were as follows:

1999 (¥):	Millions of Yen		
	Contracted Amount	Fair Value	Net Unrecognized Gain/(Loss)
Interest Rate Swaps			
Fixed rate receipt, floating rate payment .....	¥ 12,000	¥ 188	¥ 188
Interest Rate Swaptions			
Purchase contracts .....	2,000		
Fixed rate payment, floating rate receipt .....	<20>	18	(2)
Interest Rate Caps			
Purchase contracts .....	4,000		
	<45>	43	(2)
<b>Total .....</b>	<b>¥ 18,000</b>	<b>¥ 249</b>	<b>¥ 184</b>

1999 (\$):	Thousands of U.S. Dollars		
	Contracted Amount	Fair Value	Net Unrecognized Gain/(Loss)
Interest Rate Swaps			
Fixed rate receipt, floating rate payment .....	\$ 99,173	\$1,555	\$1,555
Interest Rate Swaptions			
Purchase contracts .....	16,529		
Fixed rate payment, floating rate receipt .....	<165>	148	(17)
Interest Rate Caps			
Purchase contracts .....	33,058		
	<372>	355	(17)
<b>Total .....</b>	<b>\$148,760</b>	<b>\$2,058</b>	<b>\$1,521</b>

1998 (¥):	Millions of Yen		
	Contracted Amount	Fair Value	Net Unrecognized Gain/(Loss)
Interest Rate Swaps			
Fixed rate receipt, floating rate payment .....	¥ 11,000	¥ 280	¥ 280
Fixed rate payment, floating rate receipt .....	3,000	(8)	(8)
Interest Rate Caps			
Purchase contracts .....	5,000		
	<->	(40)	(40)
<b>Total .....</b>	<b>¥ 19,000</b>	<b>¥ 232</b>	<b>¥ 232</b>

Forward exchange contracted amounts which are assigned to associated assets or liabilities and are reflected in the consolidated balance sheets are not subject to the disclosure of market value information.

Option premiums and cap premiums reflected on the consolidated balance sheets are disclosed, in brackets (< >), under the contracted amounts.

The contracted amounts of derivatives shown in the above tables do not measure the Company's exposure to credit or market risk.

#### 14. SEGMENT INFORMATION

Information about operations by line of business, operations by geographical segment and sales to foreign customers of the Companies for the years ended March 31, 1999 and 1998, is as follows:

**(a) Operations by Line of Business**

Millions of Yen							
<b>1999 (¥):</b>	Power	Ceramics	Engineering	Electronics	Total	(Elimination)/ Corporate	Consolidated
Sales to customers .....	¥ 81,429	¥ 58,166	¥ 77,185	¥ 53,671	¥ 270,451	—	¥ 270,451
Intersegment sales .....	—	—	—	—	—	—	—
Total sales .....	81,429	58,166	77,185	53,671	270,451	—	270,451
Operating expenses .....	69,844	48,834	66,465	47,653	232,796	¥ 10,245	243,041
Operating income .....	¥ 11,585	¥ 9,332	¥ 10,720	¥ 6,018	¥ 37,655	¥ (10,245)	¥ 27,410
Assets .....	¥ 78,031	¥ 62,052	¥ 54,064	¥ 67,172	¥ 261,319	¥113,090	¥ 374,409
Depreciation .....	3,775	4,098	371	4,355	12,599	1,914	14,513
Capital expenditures .....	4,821	7,571	1,131	9,481	23,004	2,771	25,775

Thousands of U.S. Dollars							
<b>1999 (\$):</b>	Power	Ceramics	Engineering	Electronics	Total	(Elimination)/ Corporate	Consolidated
Sales to customers .....	\$672,967	\$480,711	\$637,892	\$443,562	\$2,235,132	—	\$2,235,132
Intersegment sales .....	—	—	—	—	—	—	—
Total sales .....	672,967	480,711	637,892	443,562	2,235,132	—	2,235,132
Operating expenses .....	577,223	403,587	549,298	393,826	1,923,934	\$ 84,669	2,008,603
Operating income .....	\$ 95,744	\$ 77,124	\$ 88,594	\$ 49,736	\$ 311,198	\$ (84,669)	\$ 226,529
Assets .....	\$644,884	\$512,826	\$446,810	\$555,141	\$2,159,661	\$934,628	\$3,094,289
Depreciation .....	31,198	33,868	3,066	35,992	104,124	15,818	119,942
Capital expenditures .....	39,843	62,570	9,347	78,356	190,116	22,901	213,017

Millions of Yen							
<b>1998 (¥):</b>	Power	Ceramics	Engineering	Electronics	Total	(Elimination)/ Corporate	Consolidated
Sales to customers .....	¥ 85,509	¥ 58,526	¥ 72,634	¥ 51,411	¥ 268,080	—	¥ 268,080
Intersegment sales .....	—	58	—	—	58	¥ (58)	—
Total sales .....	85,509	58,584	72,634	51,411	268,138	(58)	268,080
Operating expenses .....	71,454	49,024	63,072	45,233	228,783	10,005	238,788
Operating income .....	¥ 14,055	¥ 9,560	¥ 9,562	¥ 6,178	¥ 39,355	¥ (10,063)	¥29,292
Assets .....	¥ 70,253	¥ 59,482	¥ 46,500	¥ 58,165	¥ 234,400	¥116,745	¥ 351,145
Depreciation .....	3,895	3,559	400	3,731	11,585	2,526	14,111
Capital expenditures .....	4,894	4,265	481	6,226	15,866	3,285	19,151

Power business includes insulators, bushing shells, fuse-cutout, disconnecting switches and NAS-batteries.

Ceramic products business includes honeycomb ceramics for exhaust emission control, chemical corrosion-resistant equipment, industrial heating systems and refractories.

Engineering business includes sewage treatment systems, water purification systems, noise-control systems and architectural products.

Electronics business includes color printer head actuators, translucent alumina tubes for sodium lamps, ceramic heaters for semiconductor manufacturing equipment and beryllium-copper-wrought products, etc.

Note: Products transferred between segments due to organizational changes;

Architectural products: Ceramic products business → Engineering business

Ceramic heaters for semiconductor manufacturing equipment: Ceramic products business → Electronics business

In segment information, all figures for the fiscal year under review and previous fiscal years reflect these transfers for comparison purposes.

The effects of the change of depreciation method for buildings were to increase depreciation expense and operating expenses and to decrease operating income, and change in useful lives of buildings were to increase depreciation expense and operating expenses and to decrease operating income. The effects of these changes on the 1999 segment information are as follows:

Millions of Yen						
1999 (¥):	Power	Ceramics	Engineering	Electronics	(Elimination)/ Corporate	Total
Effects of change of depreciation method for buildings						
Depreciation expense .....	¥ (156)	¥ (164)	¥ (72)	¥ (59)	¥ (298)	¥ (749)
Operating expenses .....	(140)	(145)	(67)	(54)	(298)	(704)
Operating income .....	140	145	67	54	298	704
Effects of change in useful lives of buildings						
Depreciation expense .....	37	48	17	13	68	183
Operating expenses .....	33	43	15	12	68	171
Operating income .....	¥ (33)	¥ (43)	¥ (15)	¥ (12)	¥ (68)	¥ (171)

Thousands of U.S. Dollars						
1999 (\$):	Power	Ceramics	Engineering	Electronics	(Elimination)/ Corporate	Total
Effects of change of depreciation method for buildings						
Depreciation expense .....	\$(1,289)	\$(1,355)	\$(595)	\$(488)	\$(2,463)	\$(6,190)
Operating expenses .....	(1,157)	(1,198)	(554)	(446)	(2,463)	(5,818)
Operating income .....	1,157	1,198	554	446	2,463	5,818
Effects of change in useful lives of buildings						
Depreciation expense .....	306	397	140	107	562	1,512
Operating expenses .....	273	355	124	99	562	1,413
Operating income .....	\$ (273)	\$ (355)	\$(124)	\$ (99)	\$ (562)	\$(1,413)

#### (b) Operations by Geographical Segment

The Company's operations by geographical segment for the years ended March 31, 1999 and 1998, are summarized as follows:

Millions of Yen							
1999 (¥):	Japan	North America	Europe	Others	Total	(Eliminations)/ Corporate	Consolidated
Sales to customers .....	¥ 220,748	¥ 25,865	¥ 23,819	¥ 19	¥ 270,451	—	¥ 270,451
Interarea transfers .....	21,055	5,407	296	629	27,387	¥ (27,387)	—
Total sales .....	241,803	31,272	24,115	648	297,838	(27,387)	270,451
Operating expenses .....	209,406	30,327	19,864	785	260,382	(17,341)	243,041
Operating income .....	¥ 32,397	¥ 945	¥ 4,251	¥ (137)	¥ 37,456	¥ (10,046)	¥ 27,410
Assets .....	¥ 245,736	¥ 24,797	¥ 20,300	¥ 6,667	¥ 297,500	¥ 76,909	¥ 374,409

Thousands of U.S. Dollars							
1999 (\$):	Japan	North America	Europe	Others	Total	(Eliminations)/ Corporate	Consolidated
Sales to customers .....	\$1,824,364	\$213,760	\$196,851	\$ 157	\$2,235,132	—	\$2,235,132
Interarea transfers .....	174,008	44,686	2,446	5,198	226,339	\$(226,339)	—
Total sales .....	1,998,372	258,446	199,298	5,355	2,461,471	(226,339)	2,235,132
Operating expenses .....	1,730,628	250,636	164,165	6,488	2,151,917	(143,314)	2,008,603
Operating income .....	\$ 267,744	\$ 7,810	\$ 35,132	\$ (1,132)	\$ 309,554	\$ (83,025)	\$ 226,529
Assets .....	\$2,030,876	\$204,934	\$167,769	\$55,099	\$2,458,678	\$ 635,611	\$3,094,289

1998 (¥):	Millions of Yen					(Eliminations)/ Corporate	Consolidated
	Japan	North America	Europe	Total			
Sales to customers .....	¥223,122	¥23,767	¥21,191	¥268,080	—	—	¥268,080
Interarea transfers .....	17,938	4,192	375	22,505	¥(22,505)	—	—
Total sales .....	241,060	27,959	21,566	290,585	(22,505)	—	268,080
Operating expenses .....	206,546	27,175	17,320	251,041	(12,253)	—	238,788
Operating income .....	¥ 34,514	¥ 784	¥ 4,246	¥ 39,544	¥(10,252)	—	¥ 29,292
Assets .....	¥217,215	¥23,663	¥19,400	¥260,278	¥ 90,867	—	¥351,145

The effects of the change of depreciation method for buildings and the change in useful lives of buildings with respect to segment information were as follows:

	Millions of Yen		Thousands of U.S. Dollars	
	Japan		Japan	
Effects of change of depreciation method for buildings				
Depreciation expense .....	¥ (749)		\$ (6,190)	
Operating expenses .....	(704)		(5,818)	
Operating income .....	704		5,818	
Effects of change in useful lives of buildings				
Depreciation expense .....	183		1,512	
Operating expenses .....	171		1,413	
Operating income .....	¥ (171)		\$ (1,413)	

### (c) Sales to Foreign Customers

1999 (¥):	Millions of Yen			
	North America	Europe	Other	Total
Overseas sales .....	¥ 27,490	¥ 19,475	¥ 28,850	¥ 75,815
Net sales .....				270,451
Ratio of overseas sales to net sales .....	10.1%	7.2%	10.7%	28.0%

1999 (\$):	Thousands of U.S. Dollars			
	North America	Europe	Other	Total
Overseas sales .....	\$227,190	\$160,950	\$238,430	\$ 626,570
Net sales .....				2,235,132

1998 (¥):	Millions of Yen			
	North America	Europe	Other	Total
Overseas sales .....	¥ 24,895	¥ 19,321	¥ 29,041	¥ 73,257
Net sales .....				268,080
Ratio of overseas sales to net sales .....	9.3%	7.2%	10.8%	27.3%

## 15. SUBSEQUENT EVENT

### Appropriations of Retained Earnings

The following appropriations of retained earnings at March 31, 1999, were approved at the Company's shareholders' meeting held on June 29, 1999:

	Millions of Yen		Thousands of U.S. Dollars	
	Millions of Yen		Thousands of U.S. Dollars	
Year-end cash dividends, ¥6 (\$0.050) per share .....	¥ 2,125		\$ 17,562	
Bonuses to directors and corporate auditors .....	80		661	



## INDEPENDENT AUDITORS' REPORT

To the Board of Directors of  
NGK INSULATORS, LTD.:

We have examined the consolidated balance sheets of NGK INSULATORS, LTD. and consolidated subsidiaries as of March 31, 1999 and 1998, and the related consolidated statements of income, shareholders' equity, and cash flows for the years then ended, all expressed in Japanese yen. Our examinations were made in accordance with auditing standards, procedures and practices generally accepted and applied in Japan and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the consolidated financial statements referred to above present fairly the financial position of NGK INSULATORS, LTD. and consolidated subsidiaries as of March 31, 1999 and 1998, and the results of their operations and their cash flows for the years then ended in conformity with accounting principles and practices generally accepted in Japan consistently applied during the period except for the change, with which we concur, in the accounting for depreciation of buildings, as discussed in Note 3.

Our examinations also comprehended the translation of Japanese yen amounts into U.S. dollar amounts and, in our opinion, such translation has been made in conformity with the basis stated in Note 1. Such U.S. dollar amounts are presented solely for the convenience of readers outside Japan.

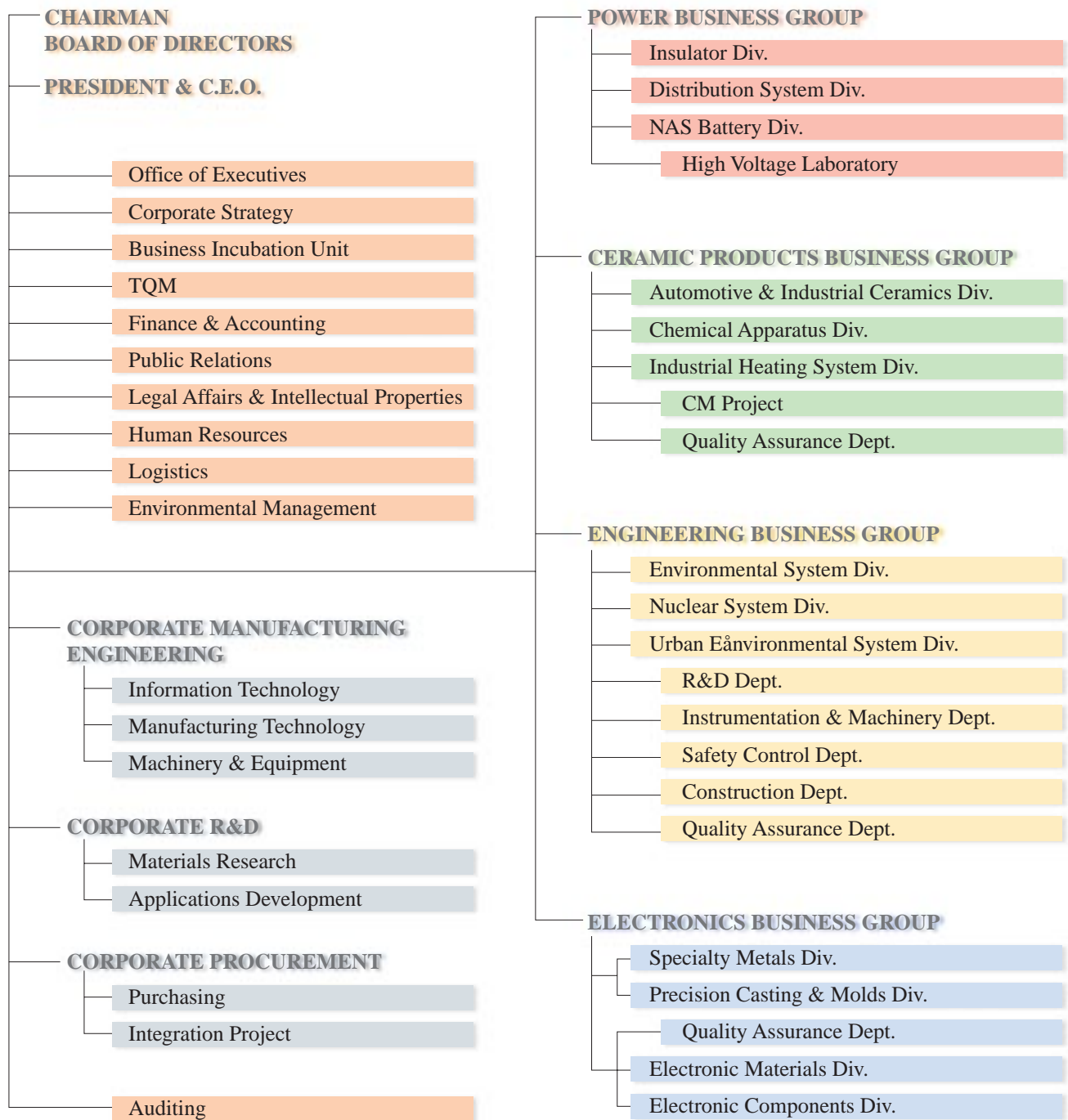
June 29, 1999

*Deloitte Touche Tohmatsu*

**Deloitte Touche  
Tohmatsu**

# ORGANIZATION

(As of April 1, 1999)



## BOARD OF DIRECTORS AND CORPORATE AUDITORS

### Representative Directors



**Toshihito Kohara**  
Chairman of the Board



**Masaharu Shibata**  
President and Chief Executive  
Officer



**Ikuo Ichikawa**  
Executive Vice President  
*Engineering and Manufacturing*



**Katsu Isobe**  
Executive Vice President  
*Finance and Administration*

### Executive Managing Directors



**Noriaki Iwata**  
*Group Executive,*  
*Electronics Business Group*



**Yoshimitsu Arakawa**  
*Group Executive,*  
*Engineering Business Group*  
*and Corporate Procurement*

### Managing Directors



**Noriyoshi Kojima**  
*Group Executive,*  
*Power Business Group*



**Takayoshi Mizutani**  
*Deputy Group Executive,*  
*Electronics Business Group*  
*General Manager,*  
*Electronic Materials Div.*



**Shun Matsushita**  
*Group Executive,*  
*Ceramic Products Business*  
*Group*  
*General Manager,*  
*Automotive & Industrial*  
*Ceramics Div.*



**Kinichi Okumura**  
*Deputy Group Executive,*  
*Engineering Business Group*  
*General Manager,*  
*Environmental System Div.*

## Directors



**Soichiro Matsuzawa**  
Group Executive,  
Corporate R&D



**Kazuo Ikushima**  
Deputy Group Executive,  
Electronics Business Group  
General Manager,  
Precision Casting & Molds Div.



**Yasushi Hattori**  
Administration, Legal Affairs &  
Intellectual Properties and  
Logistics



**Naoharu Mizuno**  
General Manager,  
Specialty Metals Div.,  
Electronics Business Group



**Ryuta Yamamoto**  
General Manager,  
Corporate Strategy,  
Business Incubation Unit  
and Auditing



**Taro Kato**  
General Manager,  
Urban Environmental System  
Div., Engineering Business  
Group



**Hiroshi Wada**  
General Manager,  
Finance & Accounting



**Hidenori Nanto**  
General Manager,  
Electronic Components Div.,  
Electronics Business Group



**Eiji Hamamoto**  
General Manager,  
Insulator Div., Power Business  
Group



**Masanao Ono**  
Group Executive,  
Corporate Manufacturing  
Engineering  
Environmental Management

## Standing Corporate Auditors



**Shosaku Kuzushima**



**Nobuo Niino**

## Corporate Auditors



**Shizuhiko Yamamoto**



**Sadami Takahashi**

(As of July 1, 1999)

# GLOBAL NETWORK

(As of July 1, 1999)



Locke Insulators, Inc.



NGK Metals Corporation



NGK Europe S.A.

## NORTH AMERICA



NGK Insulators of Canada, Ltd.

NGK-Locke, Inc.

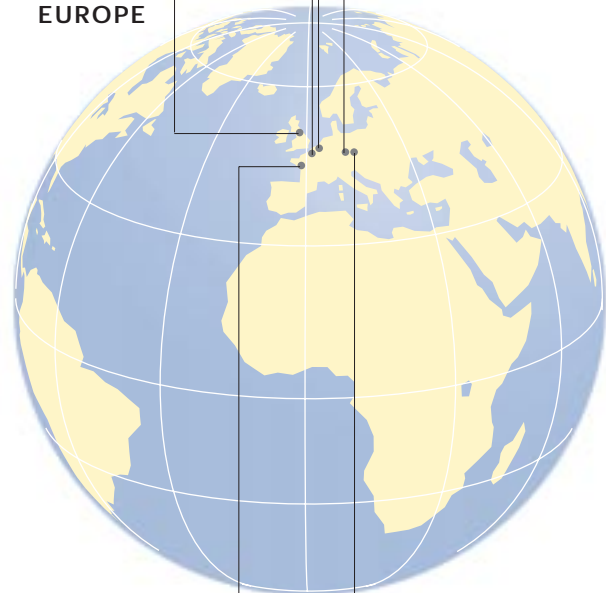


NGK Ceramics USA, Inc.



NGK-Locke Polymer Insulators, Inc.

## EUROPE



NGK Deutsche Berylco GmbH

NGK Europe GmbH.



NGK Berylco France



NGK Ceramics Europe S.A.



NGK Insulators Tangshan Co., Ltd.

**JAPAN**



NGK Insulators, Ltd.

Siam NGK Technocera Co., Ltd.

**ASIA AND OCEANIA**



- Akechi Insulators Co., Ltd.
- Ikebukuro Horo Kogyo Co., Ltd.
- NGK Chem-Tech, Ltd.
- NGK Filtech, Ltd.
- NGK Adrec Co., Ltd.
- NGK Kilntech Corporation
- NGK Thermotech Corporation
- NGK Frit Co., Ltd.
- NGK Enviro-Equipment Service, Ltd.
- NGK Mettex Corporation
- NGK Fine Molds, Ltd.
- EC-M, Ltd.
- NGK Optoceramics Co., Ltd.
- NGK Printer Ceramics Co., Ltd.
- NGK Okhotsk, Ltd.
- Tajimi Country Club Co., Ltd.
- NGK Sports Planning Co., Ltd.
- NGK Life Co., Ltd.
- NGK Building Service, Ltd.
- NGK Yu-Service Co., Ltd.
- NGK Technica, Ltd.
- NGK Expert Co., Ltd.
- NGK Compax Co., Ltd.
- Asahi Tec Corporation
- Energy Support Corporation
- Soshin Electric Co., Ltd.
- Ceramic Sensor Co., Ltd.



P.T. WIKA-NGK Insulators



P.T. NGK Ceramics Indonesia



NGK Stanger Pty, Ltd.

## SUBSIDIARIES AND ASSOCIATED COMPANIES

(As of July 1, 1999)

### Overseas

	Company's Direct and Indirect Ownership (%)	Principal Products and Services
<b>NORTH AMERICA</b>		
● NGK-Locke, Inc.	100.0	Electrical insulators and ceramic products
● Locke Insulators, Inc.	100.0	Electrical insulators
● NGK-Locke Polymer Insulators, Inc.	100.0	Electrical polymer insulators
● NGK Ceramics USA, Inc.	100.0	Automotive ceramics
● NGK Metals Corporation	100.0	Beryllium-copper products
● NGK Insulators of Canada, Ltd.	100.0	Electrical insulators and ceramic products
<b>EUROPE</b>		
● NGK Europe S.A.	75.9	Electrical insulators
● NGK Ceramics Europe S.A.	100.0	Automotive ceramics
● NGK Europe GmbH.	100.0	Ceramic products
● NGK Berylco France	100.0	Beryllium-copper products
● NGK Deutsche Berylco GmbH	100.0	Beryllium-copper products
● NGK Berylco UK, Ltd.	100.0	Beryllium-copper products
<b>ASIA AND OCEANIA</b>		
● NGK Insulators Tangshan Co., Ltd.	76.0	Electrical insulators
● P.T. NGK Ceramics Indonesia	95.0	Automotive ceramics
● P.T. WIKA-NGK Insulators	54.2	Electrical insulators
● NGK Stanger Pty, Ltd.	45.0	Power distribution equipment

### Domestic

	Company's Direct and Indirect Ownership (%)	Principal Products and Services
<b>SUBSIDIARIES</b>		
● Akechi Insulators Co., Ltd.	90.7	Electrical insulators
● Ikebukuro Horo Kogyo Co., Ltd.	72.1	Glass-lined apparatuses
● NGK Chem-Tech, Ltd.	100.0	Chemical apparatuses and parts
● NGK Filtech, Ltd.	90.0	Membrane separator filter systems
● NGK Adrec Co., Ltd.	89.2	Refractories
● NGK Kilntech Corporation	100.0	Furnaces
● NGK Thermotech Corporation	100.0	Far-infrared-ray ceramic heaters
● NGK Frit Co., Ltd.	100.0	Frits and porcelain-enameled products
● NGK Enviro-Equipment Service, Ltd.	100.0	Environmental protection systems
● NGK Mettex Corporation	100.0	Beryllium-copper-wrought products
● NGK Fine Molds, Ltd.	94.7	Molds
● EC-M, Ltd.	100.0	Engineering ceramics
● NGK Optoceramics Co., Ltd.	100.0	Ceramic electronic components
● NGK Printer Ceramics Co., Ltd.	100.0	Ceramic electronic components
● NGK Okhotsk, Ltd.	100.0	Ceramic electronic components
● Tajimi Country Club Co., Ltd.	100.0	Operation of a golf course
● NGK Sports Planning Co., Ltd.	100.0	Operation of a tennis club and a driving range
● NGK Life Co., Ltd.	60.0	Finance and insurance services
● NGK Building Service, Ltd.	100.0	Maintenance and security of in-house plants and facilities
● NGK Yu-Service Co., Ltd.	80.0	Provision of welfare services to NGK employees
● NGK Technica, Ltd.	100.0	Technical consulting
● NGK Expert Co., Ltd.	100.0	Management training and instruction services for Group companies
● NGK Compax Co., Ltd.	73.3	Packing materials
<b>ASSOCIATED COMPANIES</b>		
● Asahi Tec Corporation	40.3	Cast products
● Energy Support Corporation	40.3	Power distribution equipment
● Soshin Electric Co., Ltd.	32.0	Electronic components and devices
● Ceramic Sensor Co., Ltd.	50.0	Automotive oxygen sensors

● Consolidated Subsidiary    ● Associated Company Accounted by Equity Method

**NGK Insulators, Ltd.**

2-56, Suda-cho, Mizuho-ku,  
Nagoya 467-8530, Japan  
Tel: 81-52-872-7171  
Fax: 81-52-872-7690  
URL: <http://www.ngk.co.jp/>

**Paid-in Capital**

49,460 million yen  
(As of March 31, 1999)

**Common Stock**

354,323 thousand shares  
(As of March 31, 1999)

**Number of Shareholders**

22,589  
(As of March 31, 1999)

**Stock Exchange Listings**

Tokyo, Nagoya, Osaka, Niigata and  
Sapporo

**Auditors**

Deloitte Touche Tohmatsu





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**NGK INSULATORS, LTD.**

[www.ngk.co.jp](http://www.ngk.co.jp)