

# PERFORMANCE BY INDUSTRY CATEGORY

## Review of operations and results in Minebea's three industry categories in fiscal 2001

### Machinery Components

#### *Bearings and Bearing-Related Products*



Ball bearings



Ball bearings  
(RO bearings)



Fluid dynamic bearings



Pivot assemblies



Rod-end bearings



Spherical bearings

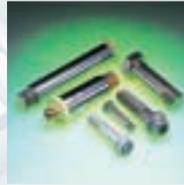
#### *Other Machinery Components*



Journal bearings



Roller bearings



Fasteners



Wheels



Special machinery  
components



Solenoid valves

### Electronic Devices and Components

#### *Rotary Components*



HDD spindle motors



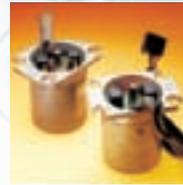
Hybrid-type  
stepping motors



PM stepping motors



Fan motors



DC brushless motors



VR Resolvers

#### *Other Electronic Devices and Components*



PC keyboards



Speakers



Switching power  
supplies



FDD subassemblies



Front light assemblies for  
reflective color LCDs



Measuring equipment  
(strain gauges, load cells)

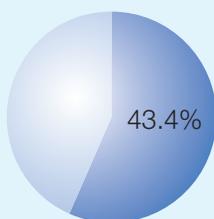
### Consumer and Others

Operations in this category focus on retail sales of furniture and interior decor products.

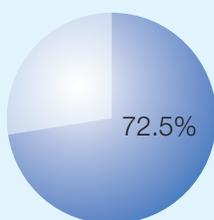
(This segment comprises the operations of subsidiary Actus Corporation. In February 2001, Minebea transferred its holding in Actus to TRS Co., Ltd.)

## Machinery Components

Percentage of net sales



Percentage of operating income



### Principal Products

#### Bearings and Bearing-Related Products

- Miniature ball bearings
- Small-sized ball bearings
- Integrated-shaft ball bearings
- RO bearings
- Fluid dynamic bearings
- Rod-end bearings
- Spherical bearings
- Roller bearings
- Journal bearings
- Pivot assemblies
- Tape guides

#### Other Machinery Components

- Aerospace/automotive fasteners
- Wheels
- Special machinery components
- Magnetic clutches and brakes
- Solenoid valves

**Sales of machinery components amounted to ¥124,461 million in fiscal 2001, down 2.6% from the previous period, and accounted for 43.4% of net sales. Reflecting efforts to lower manufacturing costs, particularly for ball bearings, category operating income advanced 8.7% from fiscal 2000, to ¥23,906 million, or 72.5% of operating income.**

#### Bearings and Bearing-Related Products

Despite solid sales of ball bearings, sales of bearings and bearing-related products edged down 0.7%, to ¥101,096 million, owing to declines in sales of rod-end and spherical bearings and pivot assemblies.

Sales of ball bearings remained firm as increased demand from manufacturers of air conditioners, vacuum cleaners and other household electrical appliances countered the impact of inventory adjustments by PC manufacturers after January 2001. Shipments to external customers rose 9.5% as shipments to Asia (excluding Japan) climbed 33.0%. Volume for in-house use also rose sharply in response to expanded production of small motors, notably HDD spindle motors and fan motors.

In response to soaring demand, we expanded our ball bearing production capacity. As of December 2000, we had established a global monthly capacity of 150 million pieces—up from 120 million pieces as of October 1999—in line with stated plans. By March of 2001, actual production had caught up to capacity. With demand from the information and telecommunications equipment, household electronic appliance and automotive industries forecast to continue growing in fiscal 2002 and demand for use in-house in fan motors, stepping motors and HDD spindle motors also expected to expand, we expect ball bearing production facilities to operate at full capacity from the second half of fiscal 2002. We have also focused on improving the precision of RO bearings and other mainstay bearing products—an important factor given the increasing use of our HDD spindle motors for high-end applications.

In November 2000, we began mass production of fluid dynamic bearings for HDD spindle motors for Seagate Technology, Inc., of the United States. In March 2001, we completed a new plant for fluid dynamic bearings and HDD spindle motors within the Bang Pa-in Plant in Thailand, thereby positioning

ourselves to respond to requirements for various types of HDD spindle motor.

Sales of rod-end and spherical bearings edged down, owing to a drop in orders in fiscal 2000. Demand from U.S. aerospace companies—the principal customers for these products—began to recover in the second half of the period, following two consecutive years of decline. We will strive to expand sales in this product group by stepping up marketing to U.S., European and Japanese manufacturers of large commercial aircraft, as well as by cultivating demand from manufacturers of small and medium-sized aircraft in South America, the PRC and other key markets. At the same time, we will implement measures to reduce inventory and improve production efficiency.

Sales of pivot assemblies fell below the fiscal 2000 level, owing to such factors as inventory adjustments by HDD manufacturers, our principal customers for these products. Although the outlook for the PC industry is uncertain, we expect the launch of a new duplex-type pivot assembly developed in-house to bolster sales in this product group.

#### Other Machinery Components

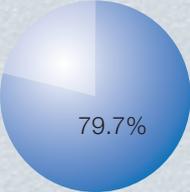
Despite firm sales of special machinery components, sales of fasteners and wheels decreased. As a consequence, sales of other machinery components fell 9.7%, to ¥23,365 million.

A decline in fastener sales was largely attributable to slack demand from the domestic aerospace and automotive industries. Although market conditions are expected to remain difficult in fiscal 2002, we will continue to implement a fundamental restructuring of this product group's personnel organization and review its product lineup in an effort to improve results.

Falling sales of wheels reflected a decline in demand from principal customers, namely, manufacturers of industrial and construction vehicles and snow tires. Based on our view that the market for steel wheels is unlikely to grow significantly in the future, we decided to withdraw from the wheel business.

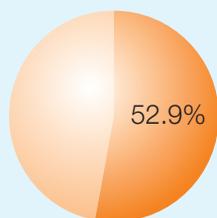
Expanded marketing to private-sector customers offset a decrease in demand for special machinery components from the public sector. As a consequence, sales of special machinery components were level with the previous period and are expected to remain so in fiscal 2002.



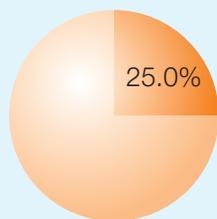
	Bearings and Bearing-Related Products	Other Machinery Components
<b>Category Sales</b>	<ul style="list-style-type: none"> <li>Net sales in fiscal 2001: ¥101,096 million</li> <li>Percentage of category sales: 79.7%</li> </ul> 	<ul style="list-style-type: none"> <li>Net sales in fiscal 2001: ¥23,365 million</li> <li>Percentage of category sales: 20.3%</li> </ul> 
<b>Fiscal 2001 Highlights</b>	<ul style="list-style-type: none"> <li>Global monthly production capacity for ball bearings was increased to 150 million pieces, in line with stated plans.</li> <li>Mass production of fluid dynamic bearings commenced.</li> <li>A plant for fluid dynamic bearings and HDD spindle motors was completed in Thailand.</li> </ul>	
<b>RO Bearings</b>	<ul style="list-style-type: none"> <li>RO bearings are high-precision bearings developed by Minebea for use in HDD spindle motors. Conventional HDD spindle motors feature two standard discrete ball bearings on the shaft. The groundbreaking RO bearing—which features two raceways on the inside of the outer ring and one each on the shaft and the inner ring fitted on the shaft—combines the functions of two standard ball bearings in one. In addition to reducing misalignment and minimizing the nonrepeatable run-out (NRRO) that often occurs with two ordinary ball bearings, RO bearings facilitate more compact motor designs. RO bearings also use Minebea’s proprietary ceramic balls, ensuring even higher levels of precision.</li> </ul>	
<b>Fluid Dynamic Bearings</b>	<ul style="list-style-type: none"> <li>In a fluid dynamic bearing, a thin layer of oil or other lubricant is injected between the shaft and sleeve. The structure of the bearing features a rotating shaft, which generates a hydrodynamic force, causing the shaft to float. The noncontact construction of fluid dynamic bearings gives them certain advantages over conventional ball bearings. Minebea’s fluid dynamic bearings bring together Seagate Technology’s design and development capabilities and Minebea’s ultraprecision machining and mass-production technologies, giving the Company a significant advantage in terms of precision, quality and manufacturing costs.</li> </ul>	
<b>Duplex-Type Pivot Assemblies</b>	<ul style="list-style-type: none"> <li>Pivot assemblies are components for positioning HDD magnetic heads, which Minebea holds the largest market share in the world. The duplex-type pivot assembly is Minebea’s original development and, essentially, combines two special structured ball bearings with a shaft. Compared to a conventional pivot assembly, a graded sleeve that fits around the ball bearings is not required. It has the advantage of smaller running torque and torque band over a conventional pivot assembly.</li> </ul>	

## Electronic Devices and Components

Percentage of net sales



Percentage of operating income



### Principal Products

#### Rotary Components

HDD spindle motors  
Hybrid-type stepping motors  
PM stepping motors  
DC brushless motors  
Fan motors  
DC brushless motors for electric power steering systems  
Resolvers

#### Other Electronic Devices and Components

PC keyboards  
Speakers  
Electronic devices  
(FDD subassemblies, magnetic heads for FDDs, MODs, front light assemblies for reflective color LCDs)  
Power electronic components (switching power supplies, inductors, hybrid ICs)  
Measuring equipment (strain gauges, load cells)

Sales in this category rose 4.0%, to ¥151,910 million, and represented 52.9% of net sales. Category operating income was held to a 0.1% increase, to ¥8,259 million, or 25.0% of operating income, owing to flagging orders and declining prices for switching power supplies, speakers and other electronic devices.

#### Rotary Components

Reflecting firm sales of small motors, including HDD spindle motors, stepping motors and fan motors, sales of rotary components advanced 15.4%, to ¥73,603 million.

Despite the impact of inventory adjustments by PC manufacturers after January 2001, we recorded firm gains in shipments and sales of HDD spindle motors. Quality and performance improvements, particularly for motors containing RO bearings, have made Minebea motors a leading choice of manufacturers for use in high-end 3.5-inch and new 2.5-inch HDDs. Accordingly, we anticipate a significant increase in demand in fiscal 2002.

In November 2000, we commenced mass production of fluid dynamic bearing HDD spindle motors for Seagate Technology, Inc. In March 2001, we completed a new plant for fluid dynamic bearings and HDD spindle motors in Thailand, thereby increasing our monthly production capacity for the latter to 10 million units and positioning us to respond to demand for HDD spindle motors containing either ball bearings or fluid dynamic bearings.

Sales of stepping motors declined as falling prices countered increased shipments for use in printers and other information and telecommunications equipment. In fiscal 2002, we will step up efforts to reduce costs and cultivate new markets for stepping motors.

Brisk demand from the information and telecommunications, household electronic appliances and other key customer industries supported sharp gains in sales and shipments of fan motors. We conduct vertically integrated production of fan motors at our plant in Xicen, Shanghai, in the PRC, and are currently building a new facility there—scheduled for completion in August 2001—which will increase our monthly production capacity for fan motors to 10 million units.

In the area of other rotary components, production of DC brushless motors for electric power steering systems for Delphi Automotive Systems of the United States proceeded steadily in fiscal 2001. During the period, we commenced sample shipments of a new VR resolver with RD converter to take advantage

of an anticipated increase in demand for these innovative units, particularly from the automotive industry.

#### Other Electronic Devices and Components

Sales in this category decreased 4.9%, to ¥78,307 million. Although sales of PC keyboards and measuring instruments were favorable, flagging orders and falling prices drove down sales of speakers, electronic devices, such as FDDs, and power electronic components, notably switching power supplies.

PC keyboard sales continued to grow despite the impact of inventory adjustments by PC manufacturers after January 2001, owing to an increase in the weighting of high-value-added models.

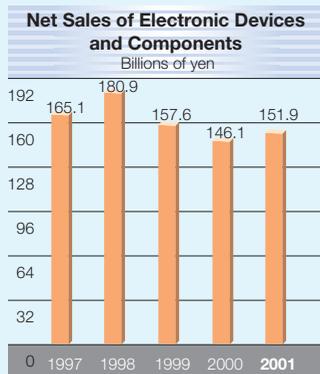
In fiscal 2002, we will focus on further enhancing product quality and increasing sales of high-value-added models. At the same time, we will work to lower manufacturing costs.

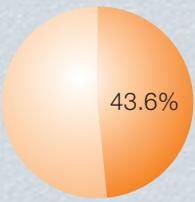
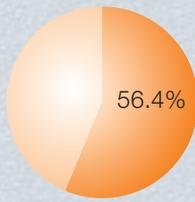
Sales of speakers dropped sharply, reflecting unfavorable conditions in the audiovisual equipment market—the principal destination for these products—and falling orders from customers in multimedia industries. In fiscal 2002, we will take steps to rationalize production and shift the weight of our product lineup toward high-value-added models. One such step will be to shift our speaker box assembly operations from Taiwan to Malaysia, a major center for global audio equipment producers.

Sales of electronic devices slipped as negative conditions in the PC market and falling prices hampered sales of FDD subassemblies and MODs. We have already commenced mass production of front light assemblies for reflective color LCDs, which have been selected for use in cellular telephones put out by leading names in this industry. A manufacturer of PDAs has also decided to employ our front light assemblies, prompting us to project a significant increase in demand in fiscal 2002.

Sales of power electronic components declined as a consequence of sluggish demand and falling prices for mainstay switching power supplies. In fiscal 2002, we will continue to promote rationalization measures in this area in an effort to improve the efficiency of development activities and the profitability of newly developed products. These will include integrating and scaling back R&D and production in the United States and R&D in Europe.

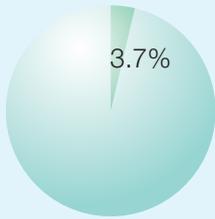
Measuring equipment sales exhibited stable growth in fiscal 2001. During the period, we reached the decision to liquidate subsidiary Minebea Geotechnology Co., Ltd., a manufacturer of construction and civil engineering-related measuring equipment. We will continue to take steps to rationalize production and narrow down our lineup of measuring equipment.



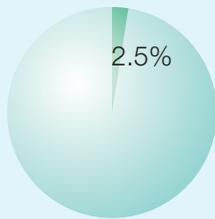
	Rotary Components	Other Electronic Devices and Components
<b>Category Sales</b>	<ul style="list-style-type: none"> <li>Net sales in fiscal 2001: ¥73,603 million</li> <li>Percentage of category sales: 43.6%</li> </ul> 	<ul style="list-style-type: none"> <li>Net sales in fiscal 2001: ¥78,307 million</li> <li>Percentage of category sales: 56.4%</li> </ul> 
<b>Fiscal 2001 Highlights</b>	<ul style="list-style-type: none"> <li>A plant for fluid dynamic bearings and HDD spindle motors was completed in Thailand in March 2001.</li> <li>Construction began on a new fan motor plant in the PRC. The plant is scheduled for completion in August 2001.</li> <li>A new facility for German small motor development subsidiary Precision-Motors-Deutsch-Minebea-GmbH (PMDM) was completed.</li> <li>Sample shipments of a newly developed VR resolver with RD converter commenced.</li> <li>Mass production of front light assemblies for reflective color LCDs was launched.</li> </ul>	
<b>New Plant for Fluid Dynamic Bearings and HDD Spindle Motors</b>	<ul style="list-style-type: none"> <li>During the period under review, we completed a new plant for fluid dynamic bearings and HDD spindle motors. The plant boasts a floor space of 24,960 square meters, large enough to accommodate a monthly production capacity of 6 million HDD spindle motors, bringing total capacity at this location to 10 million units. We will continue to introduce new equipment, as necessary in response to market needs.</li> </ul>	
<b>VR Resolvers with RD Converters</b>	<ul style="list-style-type: none"> <li>Our VR resolvers with RD converters bring together our resolvers—a result of advanced precision manufacturing technologies cultivated as a manufacturer of special machinery components—and innovative RD converters developed by Analog Devices, Inc., a leading U.S. manufacturer of ICs. We expect demand for our VR resolvers with RD converters to expand considerably in the years ahead for use in sensors for next-generation automobiles.</li> </ul>	
<b>Front Light Assemblies for Reflective Color LCDs</b>	<ul style="list-style-type: none"> <li>When attached on a reflective color LCD, such as that on a PDA or a cellular phone, Minebea's front light assemblies for color LCDs improve the brightness and readability of the display, delivering better visibility in the dark and lower power consumption than back-lit assemblies. As a consequence, we anticipate significant growth in demand.</li> </ul> <p>These innovative front light assemblies combine a light-conducting, transparent PMMA panel comprising a number of fine prisms and white LED chips. These assemblies were developed using Minebea's exclusive design and simulation software and advanced injection-molding technologies.</p>	

## Consumer and Others

Percentage of net sales



Percentage of operating income



This category comprises the operations of subsidiary Actus Corporation, which engages in retail sales of furniture and interior decor products in Japan, and which continued to record favorable results in the period under review. In line with our commitment to focusing on core manufacturing operations, bolstering results and reinforcing our financial condition, we transferred our holding in Actus to TRS Co., Ltd., in February 2001. This move marks the completion of our withdrawal from the consumer business, in which we have been involved fully since 1993.

As a consequence of this, our results for the period include the sales and income of Actus for the 11-month period from April 2000 through February 2001. As a consequence, sales in this category declined 2.0%, to ¥10,674 million, equivalent to 3.7% of net sales, while category operating income dipped 0.9%, to ¥812 million, or 2.5% of operating income.

The transfer of our holding in Actus generated ¥5,215 million in proceeds from sale of a subsidiary.