

6. Machine Element Sector

6.1 Bearings

6.1.1 Supply and demand trend

(1) Outline

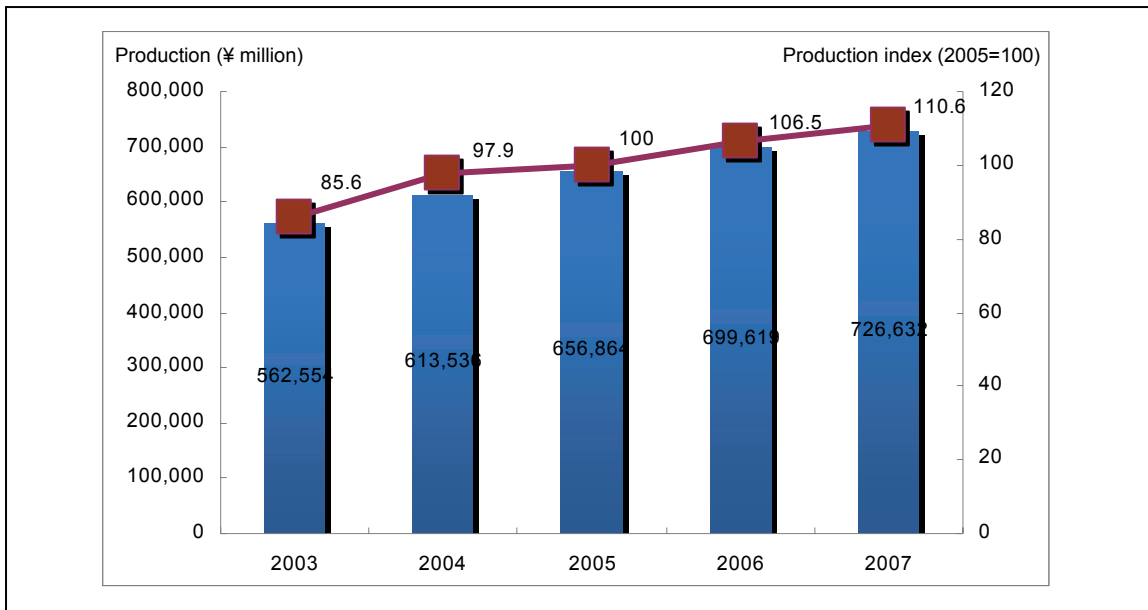
The production of finished bearing products in 2007 totaled to about ¥726.6 billion (up 3.9% year on year), maintaining a good performance. The sales also recorded a steady growth with ¥748.7 billion (up 4.0%). The export of finished bearing products and bearing parts was on a high level of about ¥390.3 billion (up 8.5%). The import of finished bearing products and bearing parts increased as in 2006 to about ¥73.6 billion (up 8.0%).

As described above, both the production and sales of bearings in 2007 were relatively satisfactory, while their export and import were on a high level, suggesting that the bearing industry enjoyed good results. As a factor behind these favorable results, it can be pointed out that demand for large-sized bearings sharply increased not merely in the field of industrial machines (e.g., machine tools and construction machines) but in that of wind power generators as well. In addition, the brisk demand for miniature bearings from automobile, aircraft and personal computer manufacturers probably led to the good results.

(2) Production

The production of bearings (finished bearing products) in 2007 was ¥726.632 billion, and the production index was 110.6 points supposing the output for 2005 were 100. Thus it kept buoyancy as in 2006 (see Fig. 6.1.1).

Fig. 6.1.1 Production of bearings (finished bearing products)

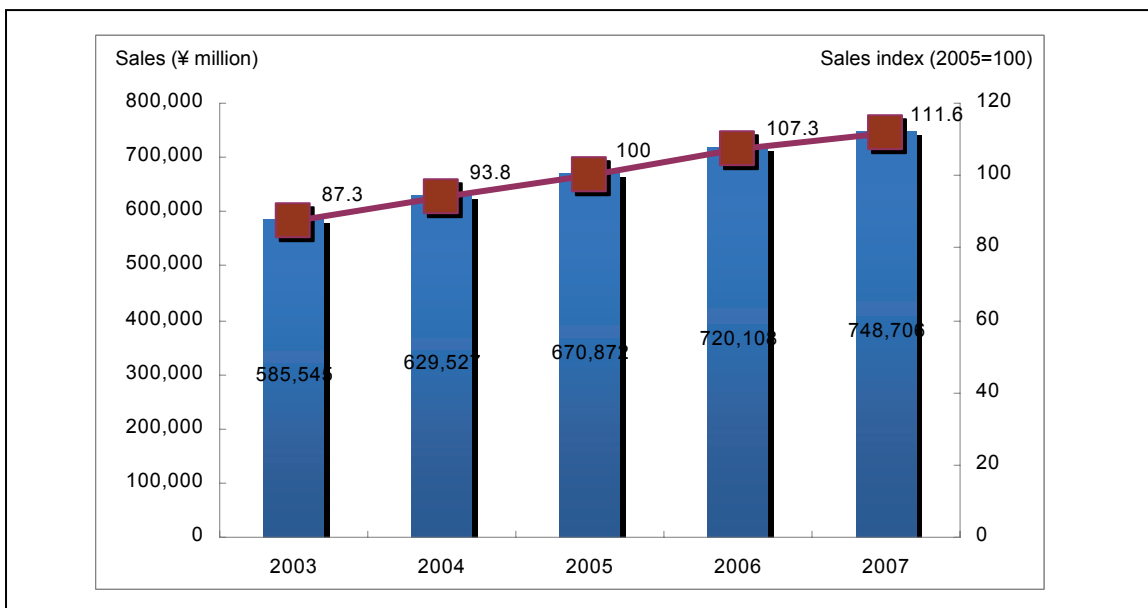


Source: Based on the Ministry of Economy, Trade and Industry, "Annual Report of Machinery Statistics."

(3) Sales

The sales of bearings (finished bearing products) in 2007 amounted to ¥748.706 billion, and the sales index was as high as 111.6 points supposing the sales for 2005 were 100. Thus the sales recorded large growth as in 2006 (see Fig. 6.1.2).

Fig. 6.1.2 Sales of bearings (finished bearing products)



Source: Same as that for Fig. 6.1.1.

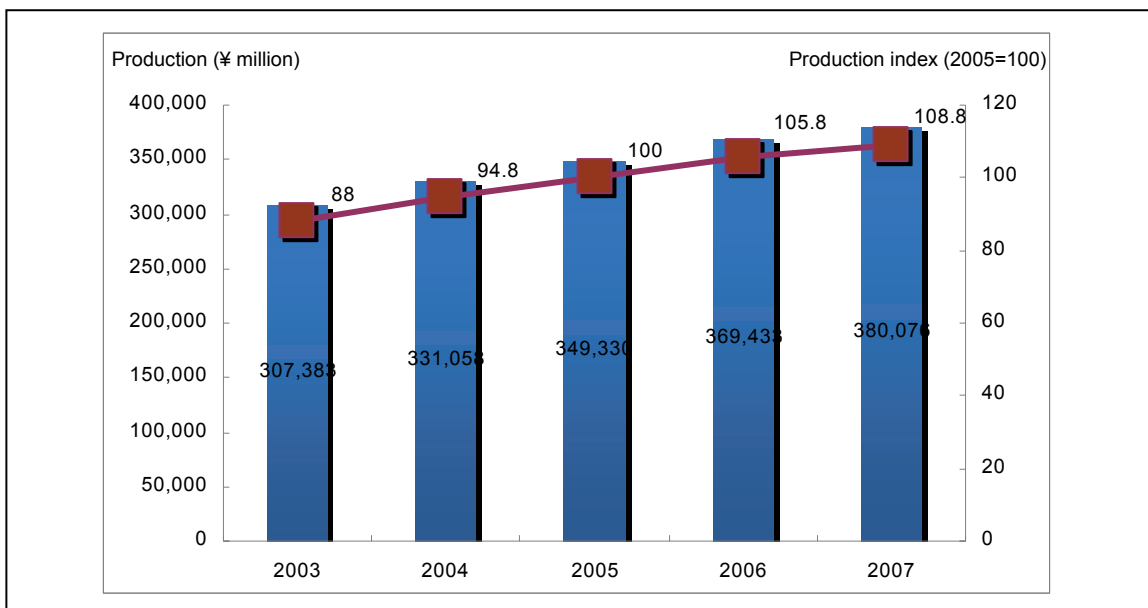
(4) Production by type of product

By type of product, the production of ball bearings (excluding those for bearing units) was about ¥380.0 billion (up 2.9% year on year), showing steady growth. The production index was 108.8 points supposing the output for 2005 were 100. Thus it can be supposed that during at least the recent five years (production index in 2003: 88 points), a very good situation continued (see Fig. 6.1.3).

The output of roller bearings was about ¥326.8 billion (up 5.0%), attaining greater growth than ball bearings. The production index reached 114 points supposing the output for 2005 were 100. It became evident that during the recent five years (production index in 2003: 82.6 points), the production of roller bearings rose sharply (see Fig. 6.1.4).

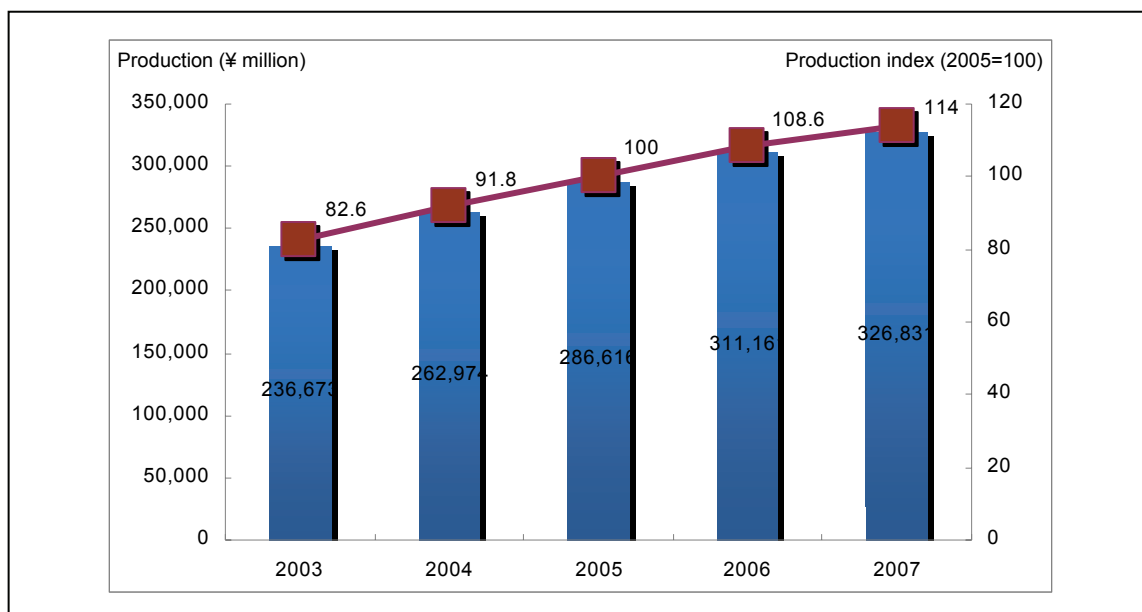
As noted above, the production of ball bearings and roller bearings in 2007 both continued an upward trend and was on a very high level. The fact that large demand for industrial machines had great effects can be mentioned as one of the reasons for this, and it is also supposed that capital investment by the automobile industry and brisk demand for automotive parts had good influences. Another probable factor is that the fact that because demand for wind power generators, which are regarded as promising products for recyclable energy generation contributing to the solution of global environmental problems, especially reduction in CO₂ emissions, has grown all over the world, demand for large-sized bearings is going up, has had great effects. For miniature bearings, the fact that demand for these bearings, which are used for various small-sized motors, has been generated due to the introduction of electronics into automobiles and that demand for aircraft parts has been created seems to have positive effects.

Fig. 6.1.3 Production of ball bearings



Source: Same as that for Fig. 6.1.1.

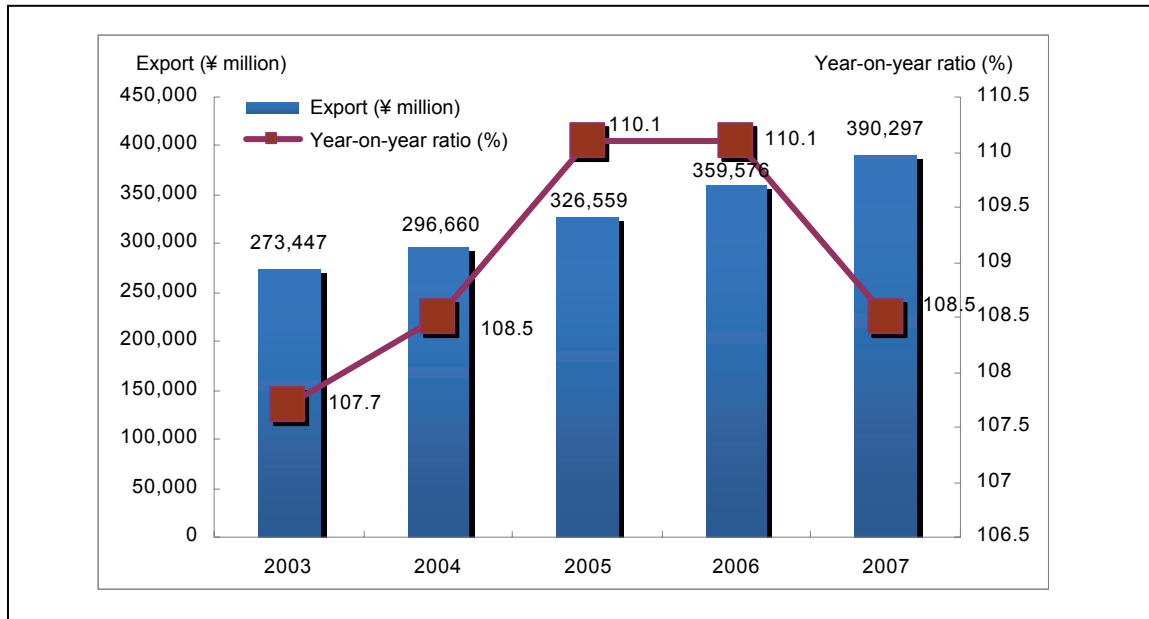
Fig. 6.1.4 Production of roller bearings



Source: Same as that for Fig. 6.1.1.

(5) Situation of export

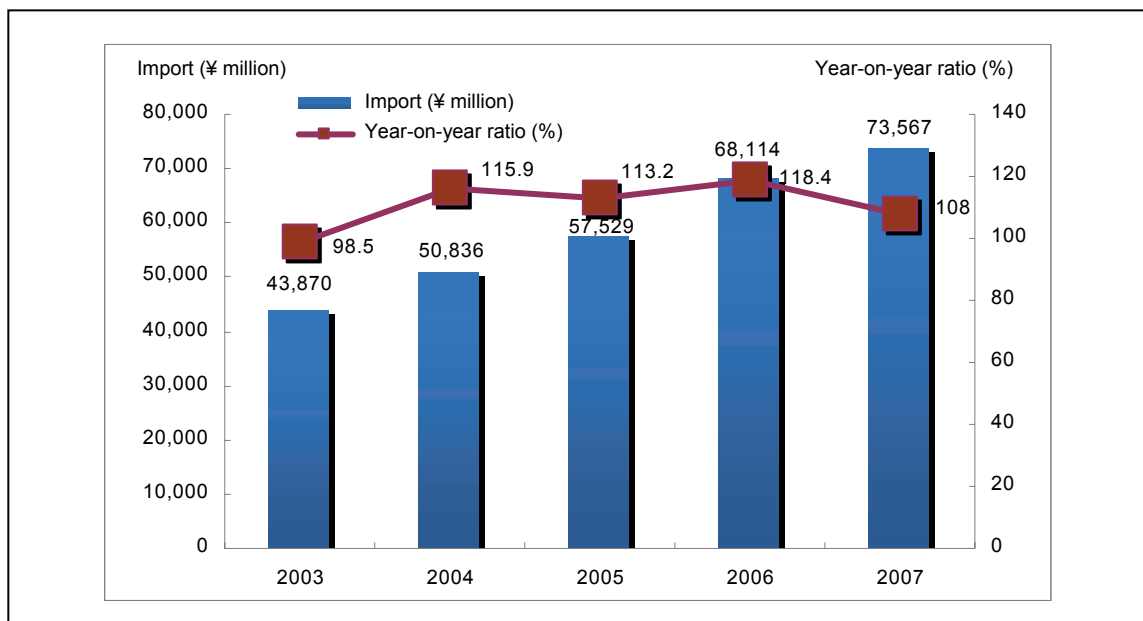
The export of bearings (finished bearing products and bearing parts) in 2007 was about ¥390.3 billion (up 8.5% year on year), which was a high growth although not so high as in 2006. The import broke ¥300.0 billion in 2005 and recorded great growth after that. One of the reasons for the good results is the fact that as demand in the automobile industry developed mainly in the BRIC, not only demand for bearings as automotive parts developed but also demand for machine tools and other industrial machines rose at the same time. In addition, as already stated, demand for wind power generators rapidly went up in the world as the generators of recyclable energy. As a result, demand for large-sized bearings for these generators grew in foreign manufacturers, which seems to have contributed to bearing export (see Fig. 6.1.5).

Fig. 6.1.5 Export of bearings (finished bearing products and bearing parts)

Source: Based on the Ministry of Finance, "Trade Statistics of Japan" and the data of the Japan Bearing Industrial Association.

(6) Situation of import

The import of bearings (finished bearing products and bearing parts) in 2007 was about ¥73.6 billion (up 8.0% year on year), maintaining an upward trend although the growth was slower than in 2006. It is supposed that as capital investment was continued to such extent as may be described as the return of manufacturing functions to Japan, demand for relatively inexpensive bearings (finished bearing products and bearing parts) rose for domestic industrial machines and as automotive parts, which then led to increasing import. This probably indicates that a global supply chain has been established for the bearing industry, too.

Fig. 6.1.6 Import of bearings (finished bearing products and bearing parts)

Source: Same as that for Fig. 6.1.5.

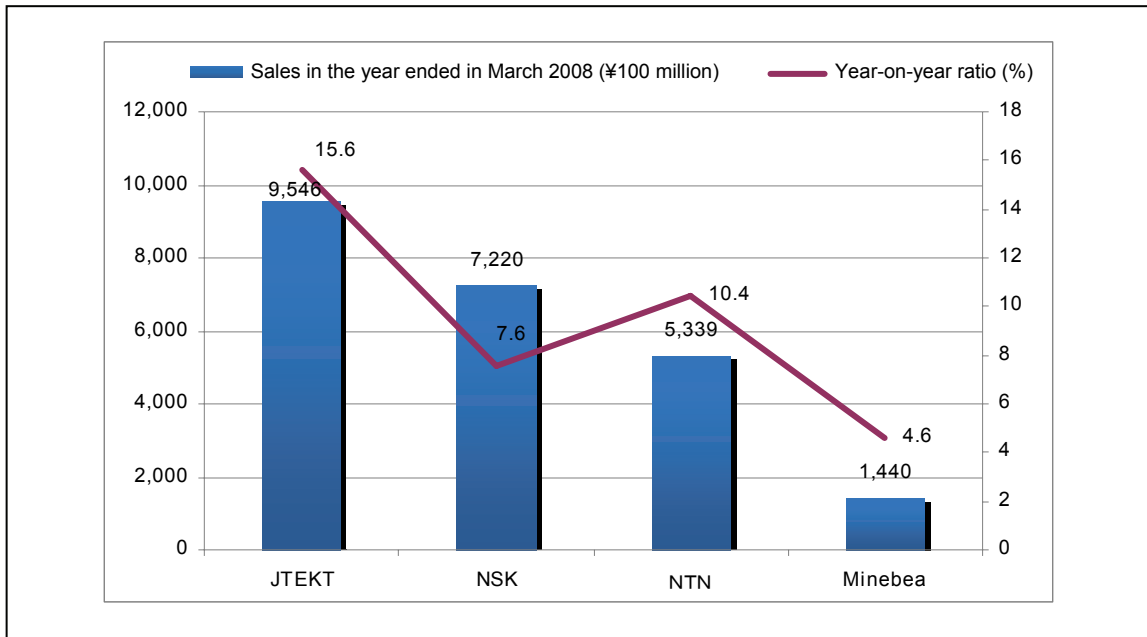
6.1.2 Results of operations and the trend of the precision machine industry

(1) Results of operations

According to the consolidated financial statements of the four main bearing manufacturers for the year ended in March 2008, all of the four companies enjoyed growth both in revenues and profit and NSK and NTN both recorded an all-time high in sales and profit for the fourth consecutive year. It can be said that behind the good results was the fact that demand was on a high level, mainly for general machines and was able to make up for higher costs due to the leap in the price of raw materials. Minebea, strong in miniature bearings, had been in a difficult situation in the recent several years as compared with other companies focusing on large-sized bearings. But in the consolidated financial statements for the year ended in March 2008, the company's sales recorded an all-time high thanks to considerable improvement in the profitability of electronic appliance business and to greater demand for automobiles and aircraft (see Figs. 6.1.7 and 6.1.8).

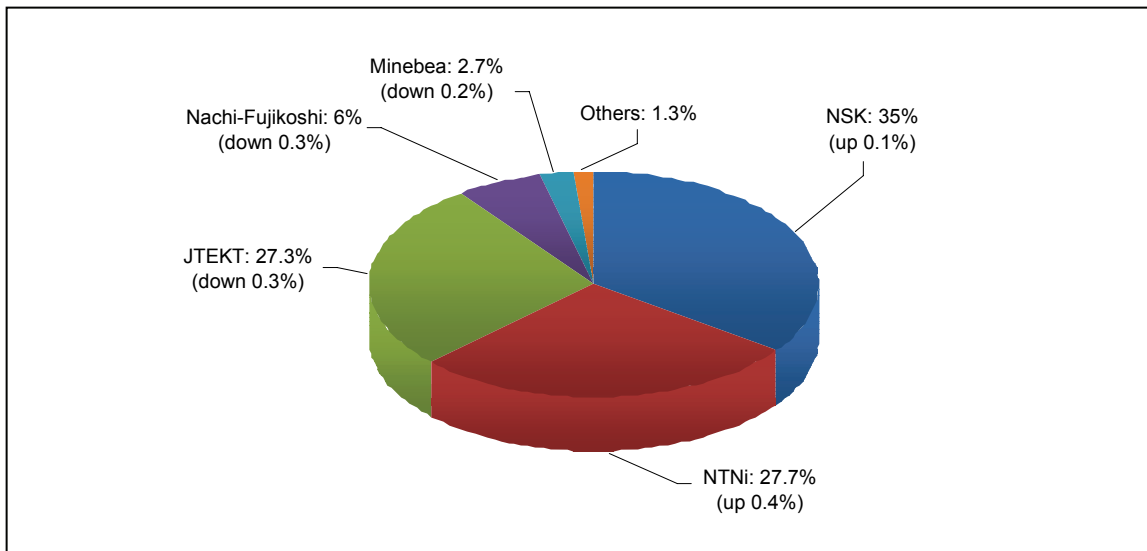
Behind the rising demand for industrial machines is the fact that as demand for wind power generators has grown rapidly, mainly in Europe, as the producers of recyclable energy, highly reliable bearing technology in Japan for large-sized bearings requiring advanced technology has stimulated demand from foreign manufacturers of wind power generators. There are some other probable reasons, too, including quickly rising demand for construction machines and machine tools in BRIC and other newly industrializing areas because of continuing active infrastructure development and capital investment and a steady growth in automobile markets other than the North American market (that has been sluggish since the subprime loan problems started in the second half of 2007). Growing demand for bearings, important parts for various industries, due to these favorable conditions seem to have led to good results in 2007.

Fig. 6.1.7 Sales and Year-on-year ratios of four main bearing manufacturers



Source: Based on the data of each company.

Fig. 6.1.8 Share of main bearing manufacturers in domestic sales



Additional data: The domestic sales in 2007 were ¥501.2 billion (up 2.2% year on year).

Source: Based on the data of the Japan Bearing Industrial Association and Nihon Keizai Shimbun, Inc.

(2) Trend of the bearing industry and technological innovation

Minebea has reinforced the system for increasing the production of aircraft parts. Specifically, Minebea's subsidiary of aircraft bearings in the U.S. stepped up mainly parts for jet engine shafts in 2008 at its California plant, and also plans to enter the civilian aircraft market in aircraft fasteners (fastening parts, such as bolts and rivets). In Japan, the company has reinforced the manufacturing equipment of its Fujisawa plant with the aim of doubling sales three years after. Minebea also plans to boost the production of miniature bearings for personal computer peripherals and automobiles; the company says that it wants to increase sales by 1.2% year on year to ¥127.5 billion in 2008, mainly at a new plant in Thailand in which the company invested ¥1.5 billion.

Minebea has focused on the manufacturing technology of aircraft parts, too. NMB-Minebea Thailand, its subsidiary, obtained a certificate from the International Special Process Accreditation System for the chemical treatment process for making aircraft stainless bearings, which enabled the plant in Thailand, too, to do the integrated production of these bearings (Thailand is the second country after Japan where the integrated production of the bearings is allowed). In addition, the company's Karuizawa Plant (Miyota, Nagano Prefecture) is making about 1,000 types of bearings, including rod end bearings mounted on the movable parts of aircraft, such as main wings and wheels, with high precision and at a great efficiency; this is performed using a processing machine that the company developed itself in cooperation with a machine manufacturer. In this processing machine, pressure, temperature, timing and other assembly factors are automatically controlled by integrating the know-how of skilled workers numerically.

NSK, NTN and JTEKT, the manufacturers of large-sized bearings, are fiercely competing for orders for bearings for wind power generators. NSK, the top maker in Japan, has already secured a large quantity of orders from European manufacturers, while NTN (which will invest a total of ¥15.0 billion by 2012) and JTEKT (which plans to invest ¥5.0-5.5 billion in the Second Kokubu Plant) have also improved the system for accepting orders for large-sized bearings. In this circumstance, in April 2008, NSK succeeded in getting orders for bearings for wind power generators from three European heavy machine manufacturers, securing orders for 2009 to 2011 in a lump. Specifically, the company will supply bearings for connecting the main axle to the blade of wind power generators and conical and cylindrical bearings mainly for speed-up gears in the gear box and for generators. These bearings are as large as 20cm to 2.5m across, and each wind power generator needs 10 to 30 of these bearings. Very large bearings are difficult to disassemble and maintain, and their operating environment is in a very cold area or on the sea (in an ocean wind farm) and unfavorable; thus very great durability and precision are needed for these bearings. Japanese manufacturers are required to make the most of their stored technology and increase their reliability.

The world leader in the market of bearings for wind power generators is SKF in Sweden, followed by the Schaeffler Group in Germany. Other major manufacturers are those in the birthplaces of wind power generators, too. Thus, the most important problem for Japanese bearing manufacturers is how to force their way into the European market. Especially noteworthy is that SKF plans to increase its production capacity by 30% as compared with that in 2007 by 2010 and is

focusing on high-value added products, such as the sale of systems for monitoring the abnormal vibrations of bearings. India and South Korea plan to construct more wind power generators in the years ahead, and it has been an urgent task for bearing makers in Japan, who are latecomers, to raise the product quality and strengthen the ability to supply.

(3) Future prospects and problems

Bearing manufacturers have continued growth due to great demand, especially for large- and medium-sized bearings for automotive parts. However, because dark signs have begun to be seen in the automobile market in North America, bearing companies are faced with the need to adopt strategies for expanding the market not only in the automobile segment but also in other sectors so as to attain further growth, while taking growth of the automobile industry in other regions.

In such a situation, high hopes have rapidly been placed on growing demand for very large and large-sized bearings for wind power generators, one of the industrial machine fields, as described above. As the need for recyclable energy increased globally, European countries started at a considerably early stage to develop recyclable energy-related industries, such as those of wind power generators, solar energy generation and biomass. These efforts have led to rising demand for bearings for wind power generators in recent years.

The above-mentioned circumstance suggests the problem that will face Japanese bearing manufacturers in entering the market of wind power generators. The automobile industry and the household electric appliance industry in Japan successfully developed those products meeting the needs of domestic users who are the fussiest about what they buy in the world, and by having done so, they expanded their business from Japan to the world very skillfully in terms of customer satisfaction, too. In other words, it can be said that having important customers in the domestic market helped enhance the international competitive power of Japanese products (excluding cellular phones). On the other hand, activities for developing the wind power generator industry in Japan have still been at the “experimental and verifying stage,” and no real users (important and fussy customers) of wind power generators exist in Japan yet. As already noted, the bearings for wind power generators Japanese bearing manufacturers intend to make are almost all those for overseas makers.

This fact tells us that Japanese bearing manufacturers are now in the growth environment totally different from that of those parts makers and component technology-oriented businesses which have grown in the domestic market together with their customers. In the situation where no needs capable of estimating the needs of foreign customers can be created in the domestic market, how can manufacturers quicken the pace of developing the products that customers need? This will also be the problem of other industries involved in products and parts in the recyclable energy field.

What symbolized the recovery of Minebea’s business results is growing demand for bearings in the aircraft industry. Minebea is the leading manufacturer of miniature bearings in the world and has a very great competitive advantage in technology. Because of this, the company will be able to secure the market for a considerably long period of time due to rising demand for aircraft all over the world.

As stated above, the bearing industry will continue to be supported by the automobile industry for the time being. But considering that demand for wind power generators and aircraft is developing as new customers (new markets), the industry can be regarded as entering an important turning point that has never come before. While the most important problem in the future is to establish, among others, the technology, supply system and high product quality that can respond to an unprecedented new market, the question common to the market of bearings for wind power generators and for aircraft will be how Japanese manufacturers can close the gap between them and their overseas customers.