Applying Fundamental Technologies to the Manufacture of High-Precision Components

Components for HDDs

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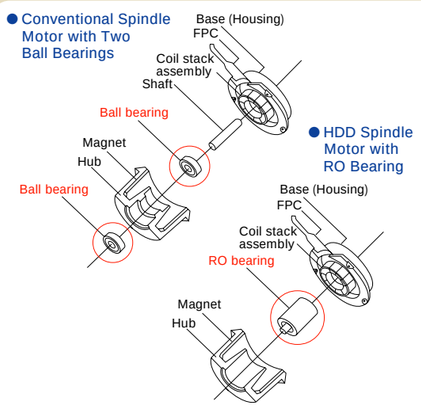
The growing presence of PCs in both the home and office and rapid technological advances are stimulating demand for HDDs with increased capacity and higher reading and writing speeds.

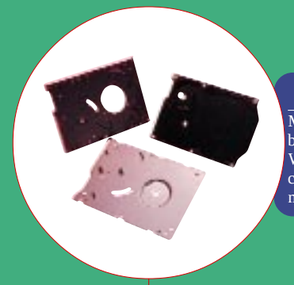
Spindle motors, of which Minebea is a world-leading manufacturer, are crucial components in HDD mechanisms. Improving the rotating speed, NRRO, sound and life span of an HDD spindle motor is thus an effective way to enhance the performance of an HDD. These factors are determined by the quality of the ball bearings used. Minebea's spindle motors contain the Company's own high-precision ball bearings, as well as other internally sourced parts, ensuring outstanding reliability. Superior accuracy is also demanded of pivot assemblies for positioning HDD magnetic heads. Here, too, Minebea has applied its high-precision bearing technologies, earning the Company a commanding 75% share of the global pivot-assembly market.

T O P I C

RO Bearings

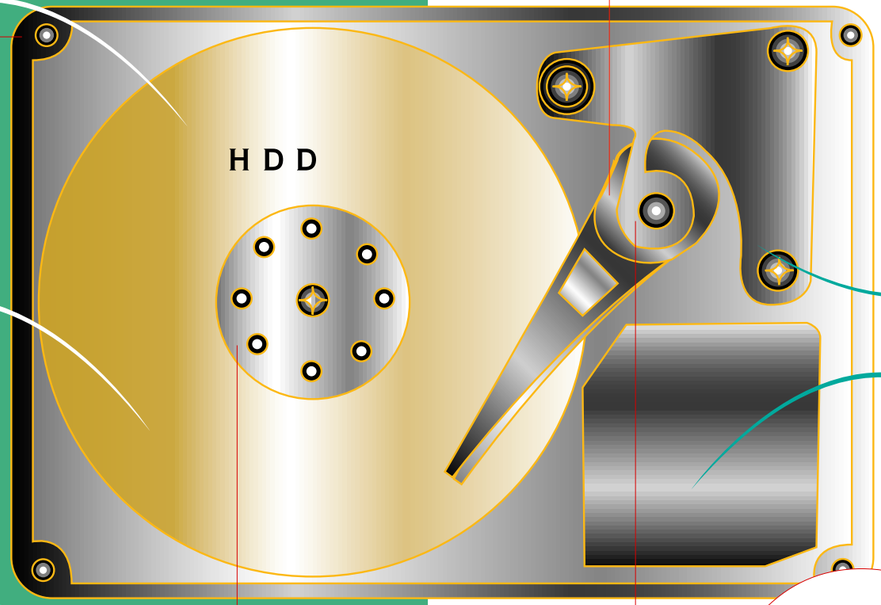
RO bearings—named for their inventor, senior managing director Rikuro Obara—are unique, high-precision ball bearings developed by Minebea for use in HDD spindle motors. Conventional HDD spindle motors contain two standard ball bearings. The groundbreaking RO bearing, however, features two raceways on the inside of the outer ring and one each on the shaft and the inner ring fitted on the shaft, essentially combining the functions of two ball bearings in one while improving the degree of parallelism of the raceway, minimizing rotational error and facilitating more compact designs. RO bearings are also used in pivot assemblies.

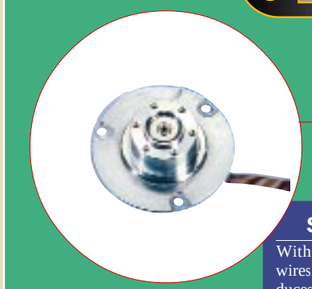




Die-cast Parts

Minebea produces die-cast bases for HDDs in-house. We also sell motors for HDDs comprising a base and a spindle motor.





Spindle Motors

With the exception of winding wires and leads, Minebea produces all parts for HDD spindle motors—from high-precision machined parts, such as ball bearings, shafts, housings and bases, to magnets—in-house.

Die-cast Parts

Minebea manufactures the die-cast swing arm, upon which the HDD's magnetic head is mounted. We also sell integrated units comprising a swing arm and a pivot assembly.

Pivot Assemblies

Minebea produces all parts for its HDD pivot assemblies, which are mounted on die-cast swing arms.

A Leading Share of the Global Market for Ball Bearings

Minebea uses its own high-precision ball bearings in its small-sized motors and pivot assemblies, which has earned these components an outstanding reputation for reliability. With the increasing technological sophistication and rapid diffusion of PCs, office automation (OA) equipment and household electrical appliances, demand for Minebea products is growing, as is the Company's share of key global markets for electronic devices and components.

Spindle motors for HDDs

Stepping motors

Pivot assemblies

Fan motors

A Highly Stable Internal Market

Internal sourcing also generates powerful synergies. By using its own ball bearings, Minebea ensures the outstanding quality of its various small motors, pivot assemblies and other components. Outstanding quality attracts increased orders which, in turn, stimulates orders for ball bearings. Minebea has thus created its very own massive and highly stable ball bearing market.

Production Volume of Ball Bearings for Internal Use
(Million pieces per year)