

# Minebea's Core Competencies

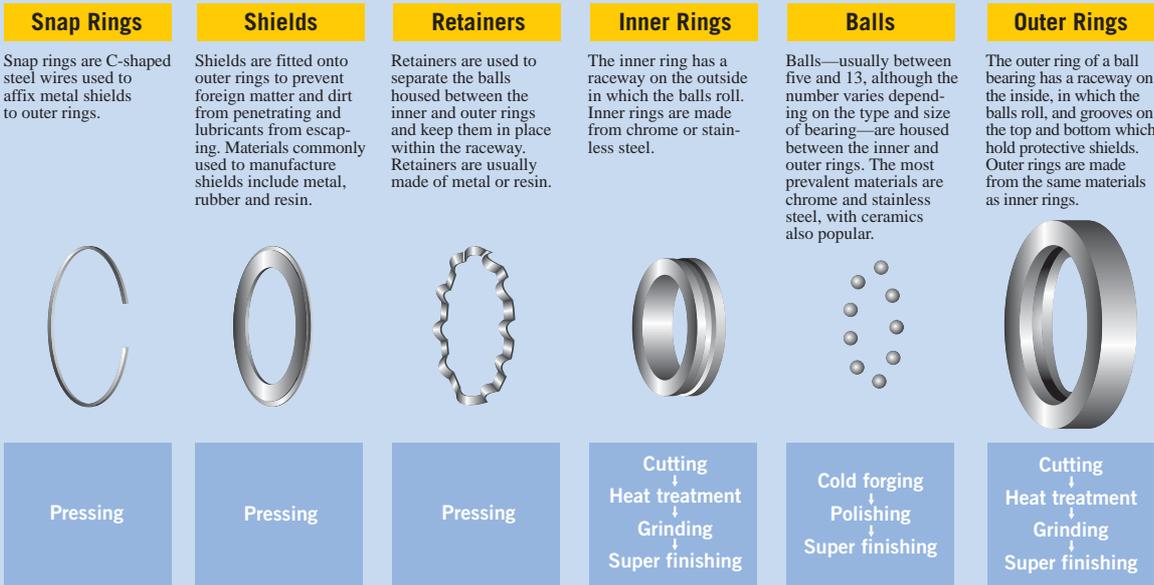
## Ultraprecision Machining Technologies

### Miniature and Small-Sized Ball Bearings: The Origin of Minebea's Ultraprecision Machining Technologies

The raceway roundness of the inner and outer rings for ultraprecision ball bearings manufactured by Minebea for use in applications requiring high precision, such as VCR cylinders and pivot assemblies for HDDs, is less than 0.05 micron. One micron is

1/1,000th of one millimeter—a particle of cigarette smoke is between 0.01 mm and 1.0 micron. Minebea's ability to mass produce ultraprecision machined products is the root of its competitive advantage.

An approach to production that ensures consistently superior-quality products from Minebea's 10 mass production bases worldwide



### Ultraprecision machining technologies and mass production of superior-quality products

The level of precision in each ball bearing production process is an essential factor in determining the quality of the finished

product. Minebea conducts all processes in-house, as well as manufactures the dies, jigs, tools and production and assembly equipment used therein. This ensures consistently superior-quality products from Minebea's 10 mass production bases worldwide.

A global network of ball bearing production facilities



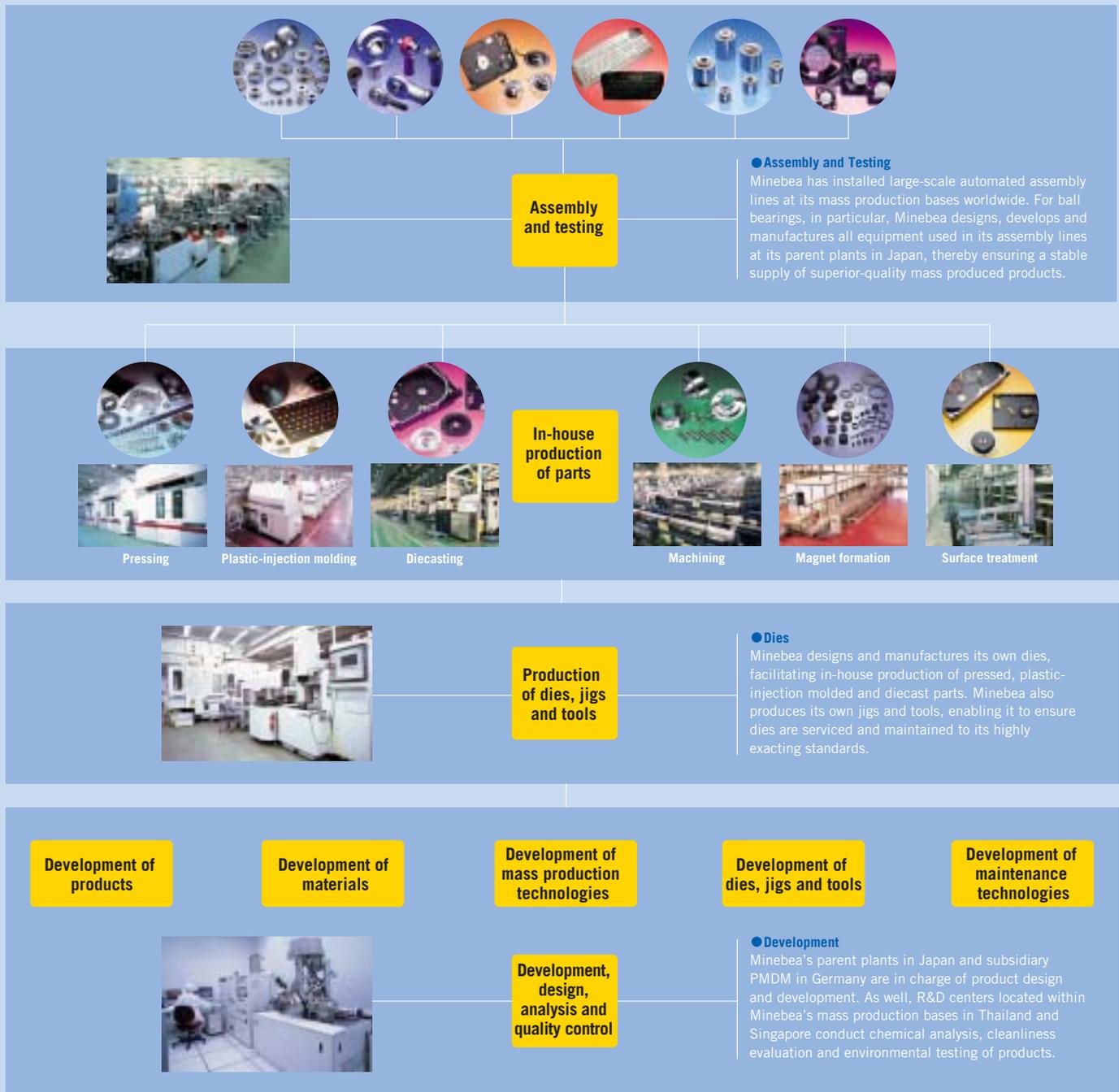
## Vertically Integrated Manufacturing System

Minebea's vertically integrated manufacturing system maximizes its ultraprecision machining technologies

The level of precision in each production process is an essential factor in determining the quality of the finished product. Minebea's vertically integrated manufacturing system enables it to conduct all

processes in-house—design and development; manufacture and maintenance of dies; production of pressed, plastic-injection molded, diecast and machined parts and ferrites; and final assembly. This system facilitates mass production of Minebea's ultraprecision components.

## Vertically Integrated Manufacturing System



## Mass Production Technologies

### Minebea's vertically integrated manufacturing system facilitates the use of its mass production technologies

Responding swiftly and effectively to the increasingly diverse needs of customers requires unparalleled superiority in terms of supply capabilities and manufacturing costs. All of Minebea's mass production facilities worldwide operate under the same vertically

integrated manufacturing system. Productive, organic links between facilities—especially those in Thailand, China and Singapore, which account for approximately 80% of the Minebea Group's production—the parent plants in Japan and global R&D bases ensure the effective integration of Minebea's vertically integrated manufacturing system and mass production technologies.

