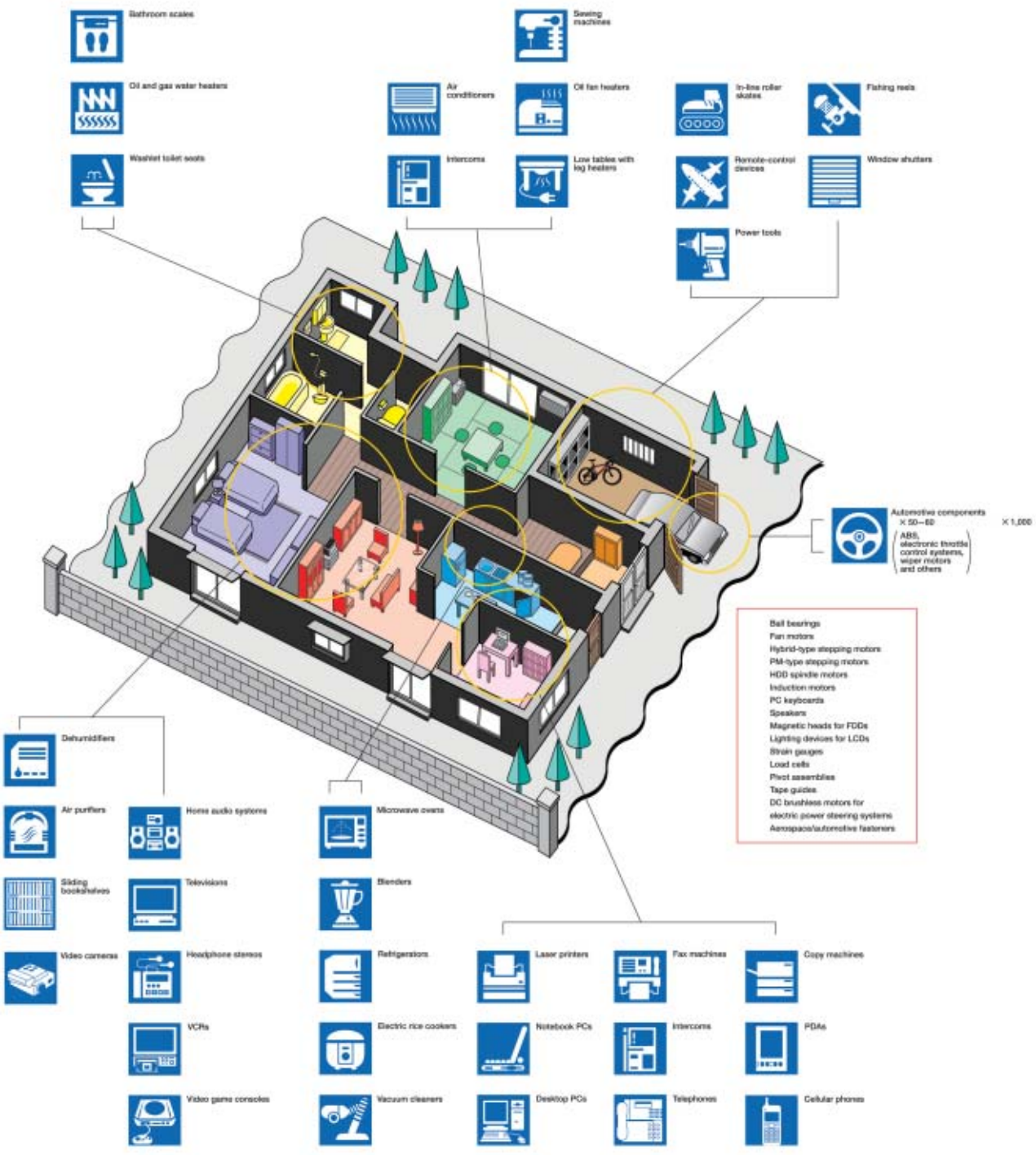
Minebea's ball bearings, fan motors, electronic devices and components and other precision products are used in a wide range of applications in the home and office, as well as in the aerospace and automotive industries. It is estimated that, for example, between 100 and 200 small-sized ball bearings are used in the average home. Ball bearings are bearings that contain rolling elements, that is, balls, which minimize friction, thus enabling devices to spin smoothly. In today's increasingly sophisticated, information-driven society, miniature ball bearings are required in ever-greater numbers for advanced home and office electronic equipment and are contributing to efforts to develop models that are smaller and use less energy.

Minebea Products: Essential to Modern Lifestyles



Reduction or Elimination of Hazardous Chemical Substances in Products

Ensure Bearings Comply with RoHS Directive

Minebea's ball bearings are used extensively in PCs, printers, copiers and other information and communications equipment, as well as in video cameras and other household electronic equipment. Minebea began taking steps early to eliminate substances banned under the RoHS directive[1] from its bearings and has succeeded in achieving this goal.

Eliminate Asbestos in Magnetic Clutches and Brakes

Electronic clutches transmit or intercept rotational force from an engine or motor, while electronic brakes control, slow and stop it. Rotational force is transmitted, intercepted, controlled, slowed or stopped via a lining of friction material. Until recently, one of the most commonly used friction materials has been asbestos, a known carcinogen. As of March 2004, Minebea completed a switch to asbestos-free friction materials in its magnetic clutches and brakes.

Eliminate Hexavalent Chromium

Fasteners for automobiles are often coated with anticorrosion coatings called chromates. Chromates contain hexavalent chromium, which is considered a hazardous chemical substance and is banned under the European Union (EU) ELV directive[2]. The Fujisawa Manufacturing Unit, Minebea's production base for fasteners, has introduced equipment for processing chromates without using hexavalent chromium and has targeted the elimination of hexavalent chromium from its automotive fasteners by June 2005.

Glossary

1. RoHS (Restriction of Hazardous Substances) directive
An EU directive banning the use of lead, mercury, cadmium, hexavalent chromium and polybrominated biphenyls (PBB) in electrical and electronic equipment brought to market after July 1, 2006.

2. ELV (End-of-Life Vehicles) directive
An EU directive aimed at reducing environmental impact and improving the recyclability of end-of-life vehicles by banning the use therein of lead, mercury, cadmium and hexavalent chromium. (Certain components and the retroactivity of this directive are still under consideration.)

Reduction of Energy Consumption/ Contribution to Prevention of Global Warming

Helping Ball Bearings and FDBs Contribute to a Healthier Environment

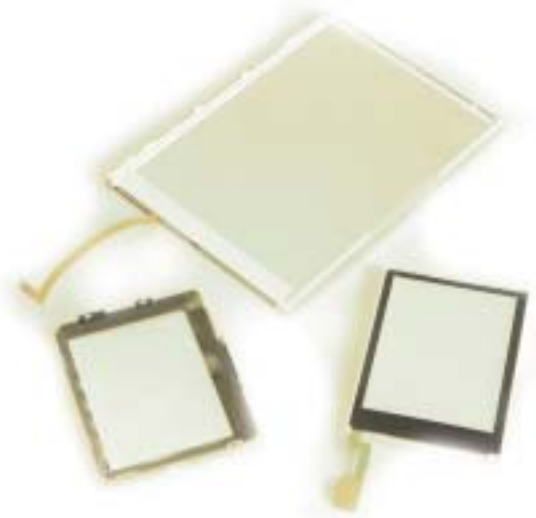
A ball bearing's precision depends on the raceway roundness of its inner and outer rings, sphericity of the balls used and the quality of the materials used in its various parts. Minebea's constant efforts to improve its performance on all fronts has enabled it to set the global standard for ball bearing precision.

Minebea's machining and maintenance technologies cultivated in the half-century since its establishment, together with its highly efficient production line layout, facilitate the production of all the ball bearing parts it uses in-house.

The outstanding precision and quality of Minebea's bearings is contributing not only to higher levels of precision for information and communications equipment, automobiles and other applications, but also to longer product lives and lower energy and resource consumption.

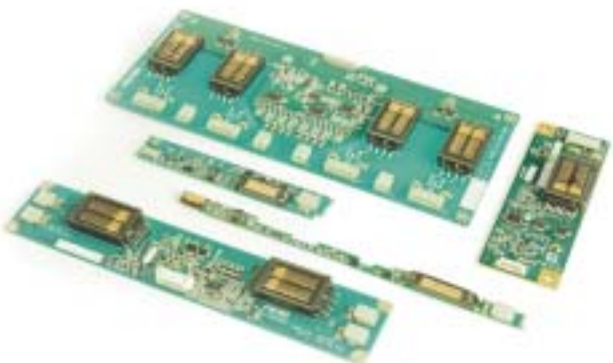
Lighting Devices for LCDs

Minebea manufactures lighting devices for LCDs used in cellular phones, portable game machines, PDAs[1] and other small mobile devices. These lighting devices involve front and backlights, both of which comprise white light-emitting diode (LED) chips—facilitating superb brightness, low energy consumption and a long product life—and micro-order prisms, ensuring unparalleled precision and quality.



Backlight Inverters

Backlight inverters are essential components of LCD units. With the market shifting to 50-inch LCD televisions, from 20-inch models, demand is increasing for longer and larger cold cathode fluorescent lamps, the light source used in backlights. Minebea has responded by developing control integrated circuits (ICs) and leakage transformers to significantly lower energy consumption and improve reliability, thereby facilitating the production of larger backlight inverters.



Glossary
1. PDA (Personal digital assistant)
PDAs are handheld personal data terminals.

Environmentally Sound Distribution

Energy-Efficient Transport

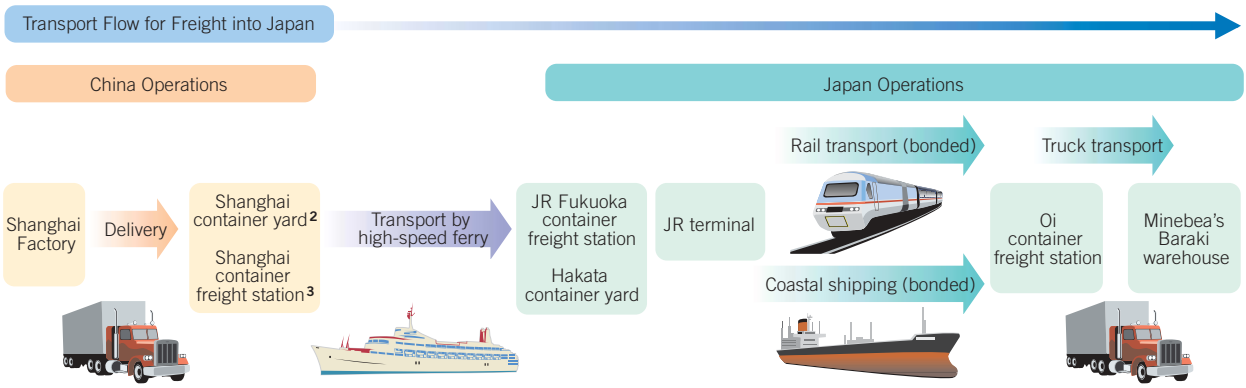
The lead time for transporting[1] exported products, equipment and materials between Japan and China by container ship is generally about 15 days. In April 2004, Minebea switched to using a high-speed ferry between Shanghai and Hakata and Japan Railways (JR) rail freight between Hakata and Tokyo, reducing the lead time to eight or nine days while at the same time using less fuel and releasing less CO_2 into the atmosphere. This was made possible by the introduction of a new roll-on, roll-off (RORO) ferry, which facilitates direct loading and unloading of containers by trailer, obviating the need for gantry cranes.

CO_2 Emissions Per Unit of Production for Standard Freight Transport Modes

	(g-CO_2/ton kilo)
Rail transport	21
Coastal shipping	40
Air (domestic)	1,483
Company vehicles	178
Company vehicles (compact)	819

Source: Data comparing CO_2 emissions per ton per kilometer, published by Japan's Ministry of Land, Infrastructure and Transport, 2000.

This table compares CO_2 emissions per unit of production for standard freight transport modes published by Japan's Ministry of Land, Infrastructure and Transport. As these figures show, emission levels for rail transport and coastal shipping are considerably lower than those for air transport and are thus seen as more environmentally sound choices.



RORO Ferry
Facilitates direct loading and unloading of containers by trailer, obviating the need for gantry cranes

Glossary

1. Transport lead time
Period from commencement of arrangements through to transfer into Minebea warehouse.

2. Container yard
Container storage facility designated by the shipping company.

3. Container freight station
Station where the shipping company transfers loaded freight to shipping containers.