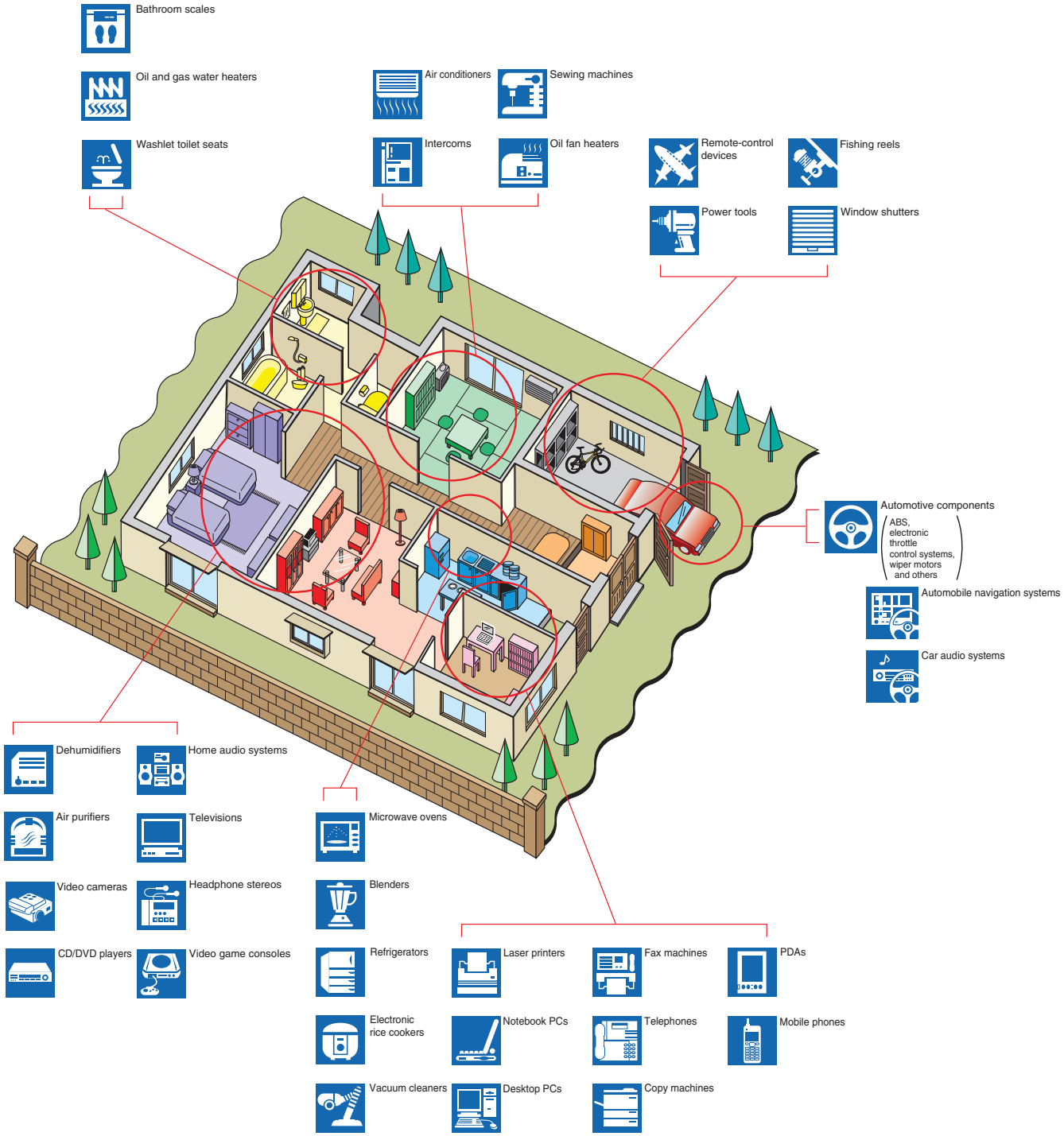
The Minebea Group manufactures ball bearings; machined components, notably aircraft and automotive components; and electronics components, including motors, liquid crystal display (LCD) backlights, strain gages and PC keyboards. These products are used in a wide range of devices in everyday life.

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 rotate smoothly. 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, use less energy and last longer.

Minebea Products: Essential to Modern Lifestyles



Development of Environment-Friendly Products

◎Contribution to the global environment with high-accuracy, high-quality bearings

"Circularity of groove between outer ring and inner ring", "sphericity of ball" and "material quality of components" are key factors for accuracy of ball bearings and significant improvement of all the elements can increase accuracy.
Minebea group manufactures all the components by ourselves using our own machining tools making the most of know-how accumulated over 50 years, maintenance technology and effective production line layout to pursue high-accuracy at every moment.
We also started LCA (Life Cycle Assessment) to recognize environmental burden related to products and make efforts to decrease the load. The bearings manufactured in such conditions not only help improve accuracy of information and telecommunications equipment, household appliances and cars but also contribute to lengthen product life, save energy and save resource.

Miniature/small-sized ball bearings

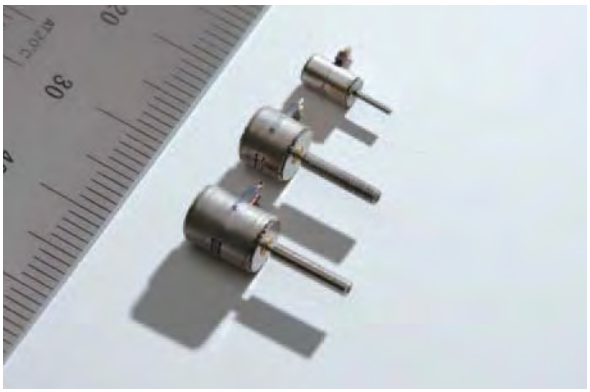
◎Strain gauge type force sensor

A strain gauge is a resistive element developed using a photo lithography technology (printing gauge patterns with thin metal resistor foil). By adhering to load gauge (portion where strain is caused), strain due to weight and pressure applied to it is detected as change of electric resistance. The strain gauge is so small and light that weight and inertia are negligible to have excellent sensitivity, stability and long fatigue life. It is user-friendly, has wide limit of operating temperature, and can be used to measure various kinds of objects such as metal and plastic. Such advantages enable strain gauge type force sensors to be adopted as sensors in weight scales and balance measuring sensors.
We use lead-free solder and have eliminated hazardous substances such as phthalate compounds so that our products comply with the Restriction of Hazardous Substances (RoHS) directive.

Strain gauge type force sensor

◎World's smallest-diameter permanent magnet (PM)-type stepping motor (3.2 mm diameter)

In recent years, demand has grown rapidly for permanent magnet (PM) stepping motors for use in small lens actuators for digital still cameras and other applications.
Minebea has developed a PM stepping motor with a 3.2 mm diameter. The world's smallest in terms of diameter, the motor achieves superior performance, combining sufficient output power as a lens drive actuator as well as high-precision step driving.
The motor facilitates the construction of ultra-small lens units for camera-equipped mobile phones, demand for which is expanding rapidly, making it possible to design thinner and smaller camera-equipped mobile phones. Higher resolution also makes it possible to incorporate autofocus and zoom functions and enhance the performance of camera-equipped mobile phones.



World's smallest-diameter stepping motor (right) and stepping motors with 6 mm diameter (center, left)
Source: Minebea (As of April 2008)

In-house production machinery

◎Environment-friendly production machinery

Minebea has designed, developed and manufactured production machinery for bearings, which are our main products, to improve precision and quality of our products. We have reduced electric power consumption and amount of resources including air required in manufacturing as a way of reducing energy and emission of carbon dioxide during production.

Example of improving grease shielding machine
Our new machine performs the same work as three conventional machines. Space occupancy is thus decreased and the new machine requires far less power and air than conventional machine.

Bearing parts manufactured with in-house production machinery