

Research and Development

Research and Development Activities

Concentrating Technology Resources in Growth Markets and Focusing on the Development of New Products

In its R&D activities, the TDK Group is drawing its resources together to focus on strengthening and expanding new product development to meet the constantly diversifying needs of the electronics market. Specifically, TDK is working on next-generation recording

products and micro-electronic modules for mobile communications applications. The Group also strives to create energy-saving, environmentally friendly devices built upon expertise in materials technology and design technology.

The Group is currently concentrating its technology resources on several growth markets: communications, automobiles, industrial equipment and energy, and home information appliances. This will allow it to further promote efficient research and development in the business areas of passive components and magnetic

applications. The Group conducts R&D on technologies and products from basic research through to application development, leading to the creation of highly original commercial offerings.

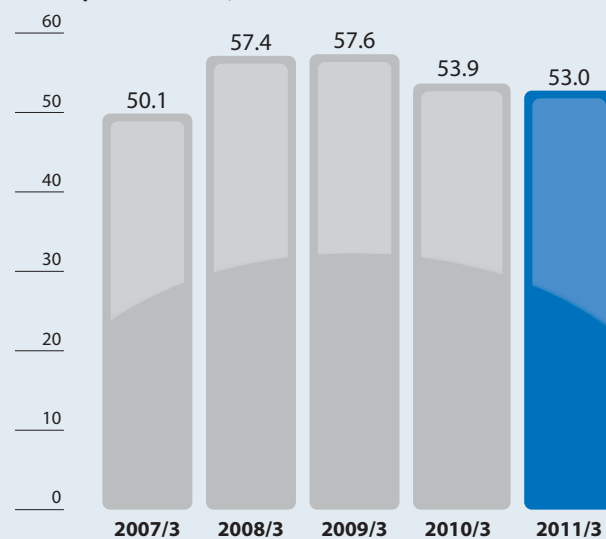
In the field of passive components, TDK has leveraged its core technologies to develop next-generation multilayer ceramic chip capacitors and inductor products. It has also commercialized such EMC components as EMC filters, composite electromagnetic sheets, and electromagnetic absorbers for anechoic chambers, and has greatly enhanced the performance of anechoic

chamber facilities. In addition, TDK is reinforcing its lineup of high-frequency and other module products.

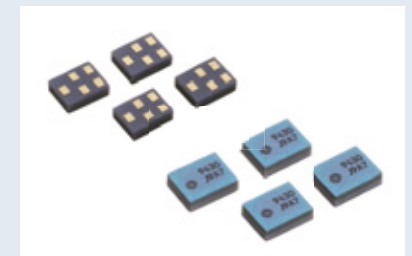
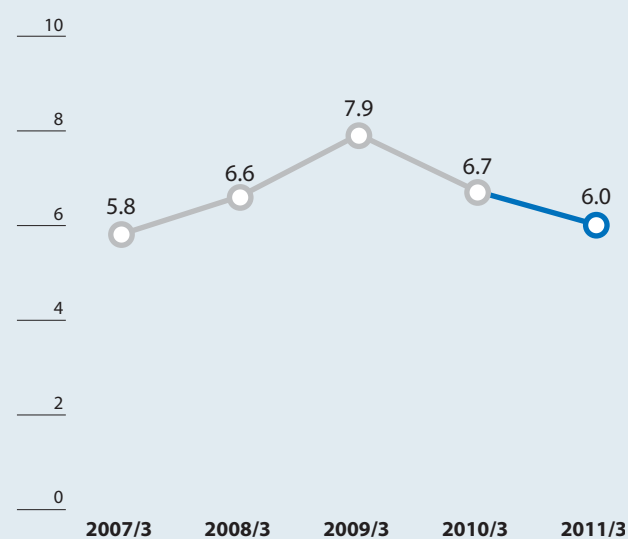
In the field of magnetic applications, TDK creates and markets next-generation ferrite magnet products and develops next-generation high recording-density heads and devices for hybrid and electric cars.

R&D expenses in fiscal year 2011 decreased 1.8% year on year to 52,973 million yen, equating to 6.0% of net sales.

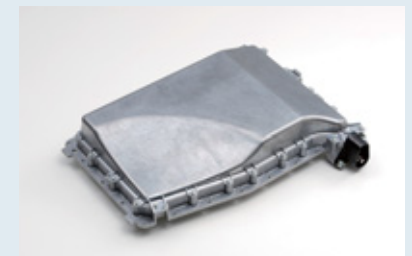
R&D Expenses (Billions of yen)



Ratio of R&D Expenses to Net Sales (%)



SAW filters for mobile phones



DC-DC converter for hybrid electric vehicle

Research and Development

R&D Network

Worldwide R&D Framework Responds to Diverse Needs

TDK has organized an R&D network that spans the globe, with key bases in Japan, Asia, the United States, and Europe.

The Group has acquired the knowledge and technologies to respond to cutting-edge demand by utilizing its predominance in specific business fields in each region. By repeatedly designing prototypes and applications and sharing the results throughout the Group, TDK is able to flexibly meet a wide range of needs and offer solutions tailored to local requirements.

Japan

Japan is the center of the Group's research network. As such, it conducts conventional R&D and also has the facilities to support sites in other countries.

These facilities bring together Japan's unique research accomplishments with the most advanced manufacturing technologies and expertise. Information is quickly collected concerning global market trends, new standards, and so on, and used to develop new products and technologies in anticipation of future needs.

Asia



In response to soaring worldwide demand for the high-performance batteries used in hybrid and electric vehicles and mobile devices, TDK's R&D centers in Asia carry out development focused on electrode materials. Research is also being conducted to develop magnetic and dielectric materials in collaboration with Group bases in Japan.

With the United States being the origin of many communications standards, R&D centers here are applying their strengths in the design, development, and assessment of wireless antennas to precisely assess and measure communications equipment that uses extremely weak signals.

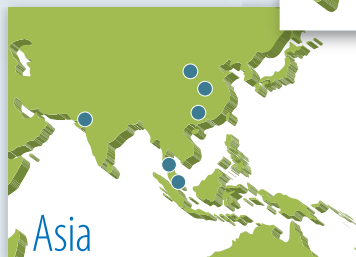
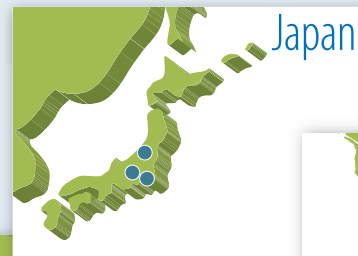
Magnetic heads, power supplies, and smart grid-related products are also being developed.

Europe



At its R&D centers in Europe, TDK develops cutting-edge electronic components for mobile phones. Research is also being conducted on products used in automobiles and so on. In particular, TDK possesses world-class development technologies for components and modules used in mobile communications devices.

United States



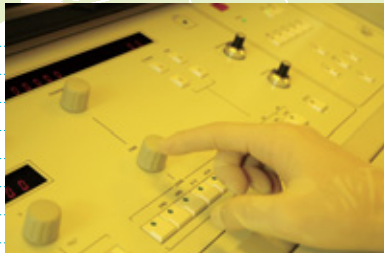
Research and Development

R&D Facilities in Japan

The TDK Group has five R&D facilities in Japan supporting its growth. Each site conducts R&D on new products and technologies in specific fields.

SQ Research Center

The SQ Research Center conducts basic research on next-generation recording and magnetic technologies, and their product applications.



Devices Development Center

The Devices Development Center pursues and searches for technologies that will be crucial in the future and creates new devices based on TDK core technologies and market trends.



Application & Analysis Center

The Application & Analysis Center strengthens and deploys material analysis technologies company-wide and supports to solve technological issues, leading to the development of new products.



Materials & Process Development Center

The Materials & Process Development Center aims to establish breakthrough component technologies that lead to new commercial products and trends. It both develops new materials technologies and manufacturing processes, and builds advancements into existing ones.



Production Engineering Center

The Production Engineering Center develops technologies and equipment to advance and improve manufacturing processes. The technologies and equipment it creates are deployed worldwide.

