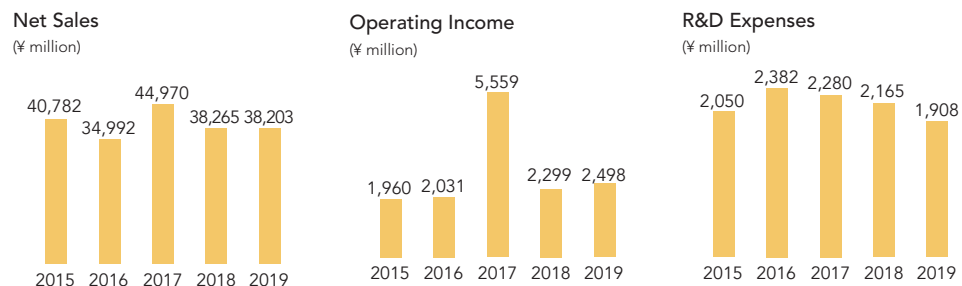


Segment Information

Energy

In the Energy segment, we engage in the production and sale of a range of batteries and devices, including coin-type lithium ion rechargeable batteries, industrial-use lithium ion batteries and electrodes for these batteries, consumer-use lithium ion batteries, lithium primary batteries, button batteries, battery chargers, and battery packs. We are also involved in electricity sales through solar power generation.



Overview of Main Products

Category	Main Products
Primary batteries	Heat-resistant coin-type lithium manganese dioxide batteries
	Coin-type lithium manganese dioxide batteries
	Cylindrical-type lithium manganese dioxide batteries
	Lithium thionyl chloride batteries
	Air Patch™ battery (thin flexible batteries)
	Silver oxide batteries
Rechargeable batteries	Prismatic-type lithium ion batteries
	Laminate-type lithium ion batteries
	Coin-type lithium ion batteries
	High-power/high-capacity button-type rechargeable batteries
	Sulfide-based all-solid-state batteries
Battery-related products, etc.	Battery chargers
	Battery packs
	Electrode-applied products (oxygen sensors, hydrogen gas generators)
	Electrodes
Solar power generation	Electricity sales



Segment Information

Energy

▲ Fiscal 2019 Business Results

Sales of coin-type lithium ion rechargeable batteries (CLBs) for hearing aids and other products increased. However, sales of consumer-use lithium ion batteries decreased due to the impacts of the COVID-19 pandemic, such as temporary suspension of factory operations in China, and sales of heat-resistant coin-type lithium batteries for the automotive market declined. As a result, net sales for the Energy segment decreased 0.2%, or ¥62 million, to ¥38,203 million. Operating income increased 8.7%, or ¥199 million, to ¥2,498 million, reflecting the cost reduction effect on fixed expenses for consumer-use lithium ion batteries, although profits declined for heat-resistant coin-type lithium batteries due to their lower sales.

▲ Direction of the Energy Segment

In the Automotive area, we will continue to strengthen our competitive capabilities in heat-resistant coin-type lithium batteries for use in tire pressure monitoring systems (TPMS). As installation of such systems becomes mandatory in many countries, we will respond by utilizing our proprietary Analog Core Technologies in product capabilities and promoting joint development with major TPMS manufacturers.

In the Home Life & Infrastructure area, to meet rising demand for adoption of the Internet of Things (IoT) in self-reading systems for smart meters, we will use Analog Core Technologies to ramp up production capacity for cylindrical lithium batteries while using high-capacity cell technology to further differentiate our offerings.

For the Health & Beauty Care area, we will take steps to respond to the growing demand for CLBs, which has accompanied the widespread use of rechargeable batteries for hearing aids. These steps include differentiating our offerings through the use of Analog Core Technologies, bolstering our production capacity, and enhancing our lineup for these batteries. In these ways, we will expand the adoption of our CLBs among hearing aid manufacturers overseas, such as in Europe, aiming to capture a double-digit market share at an early stage.

Furthermore, our technological competence with respect to lithium ion batteries, centered on Analog Core Technologies, enables us to meet a wide range of user needs. Leveraging this competence, which includes high output, temperature characteristics, rapid charging and discharging, long life, advanced safety, and durability, we will work to enter such new areas as drones, robots, and the IoT.

TOPICS

Installation of Production Equipment for Coin-Type All-Solid-State Batteries Using Sulfide-Based Solid-State Electrolytes

In October 2020, we started installing production equipment for coin-type small-sized all-solid-state batteries with sulfide-based argyrodite type solid-state electrolytes at the Ono Works of Maxell, Ltd. The solid-state electrolyte is made from high-performance material developed in collaboration with Mitsui Mining & Smelting Co., Ltd. We worked continually to develop materials with Mitsui Mining & Smelting and other material manufacturers in Japan, and to enhance our original process technologies for dispersion, forming, and sealing. These continued efforts resulted in dramatic improvements in performance, and we succeeded in building a process for production. We realized all-solid-state batteries offering high performance and reliability with input-output characteristics around 10 times higher than the initial samples shipped in September 2019, while retaining the same capacity, service life, and other characteristics. With this recent installation of equipment, we are now able to prepare for production and an increase in sample volume. We also plan to utilize the micro battery resources of the Ono Works to transition to full-scale mass production in 2021. In addition, we have applied for 42 patents including Japan, to protect Maxell's technologies related to all-solid-state batteries such as this one.

Maxell Starts Receiving Orders for Japan's First Environmentally Considerate Galvanic Cell-Type Lead-Free Oxygen Sensors Using Proprietary Weak Acid Electrolytes

Galvanic cell-type oxygen sensors are small and light, and they operate at room temperature. They provide a low-cost, easy way to measure oxygen concentration, and are consequently used in numerous applications such as oxygen concentration measurement to prevent oxygen deficiency. The anodes of such sensors have conventionally been made from lead, but amid a tightening of environmental regulations around equipment fitted with oxygen sensors, such as the European Restriction of Hazardous Substances (RoHS) Directive, we have newly developed a compliant environmental galvanic-cell-type oxygen sensor (KE-LF series). The sensor uses our proprietary weak acidic electrolyte liquid, which is optimal for a lead-free anode, so it is not affected by acid gases, such as carbon dioxide. These lead-free oxygen sensors provide long service life and high reliability, and can be used to replace conventional sensors.

Main Characteristics of Coin-Type All-Solid-State Batteries

1. Performance stability for more than 20 years (estimated through accelerated testing)
2. Superior performance at a wide range of temperatures from -50°C to 125°C
3. High input-output characteristics and high energy density even with a small size
4. Increased supply capacity will enable provision of samples for a wide range of customers



Received the "Health and Welfare, Biotechnology, and Medical Parts and Components Award" at the 2020 "CHO" MONODZUKURI Innovative Parts and Components Award (organized by the MONODZUKURI Nippon Conference and the Nikkan Kogyo Shimbum, Ltd.).