



Main Business Activities: Manufacturing of Semiconductors and Electronics Equipment

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Environmental Approach

In manufacturing semiconductors, which requires the use of numerous chemical substances, we are focusing on efficiently using resources, recycling resources, and reducing amounts of waste materials generated in each phase of the production process. The Technology Development Center works day-in, day-out to contribute to the preservation of the environment by developing power electronics technology that is essential for such next-generation clean vehicles as electric vehicles and hybrid vehicles.

Activities

Development and Design

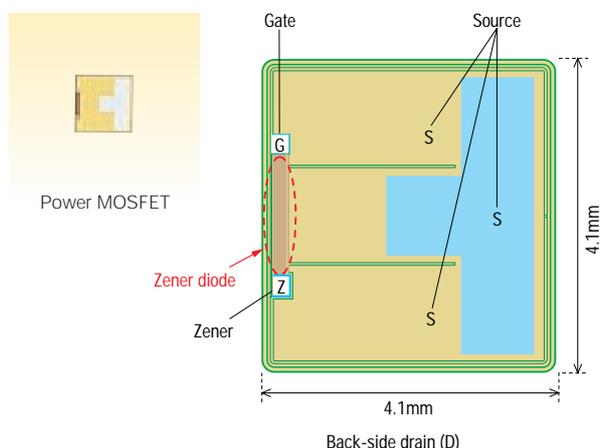
Development of New DC-AC Inverter (Pre-Installed Type)

This DC-AC inverter (pre-installed type) converts the DC 12V current from an automobile battery into an AC 100V current, enabling household electric appliances to be operated inside vehicles. We commenced our business in DC-AC inverters in August 1995 with the start-up of production of a vehicle-mounted DC-AC inverter as a dealer option. Today, we are developing and manufacturing DC-AC inverters that are mounted as standard equipment on some vehicles.

In fiscal 2000, we developed a new compact, low-cost, high-performance DC-AC inverter (mounted on vehicles as standard equipment). By making energy-conservation considerations through a compact, lightweight DC-AC inverter and designing an optimal-scale production line, we are restraining our consumption of energy, which has allowed us to reduce the volume of energy used during production.



Development of Power MOSFET for D4 Engines



D4 engines are advanced engines that efficiently use energy resources and help protect the environment. These engines operate based on a method whereby gasoline is directly injected into a cylinder that intakes large volumes of air only. The chief advantage of this method is precision control during fuel injection, which allows highly efficient combustion of even small amounts of fuel. D4 engines enable the ultra-lean combustion of an extremely thin mixture of gasoline, approximately one-third the mixture combusted by conventional gasoline engines.

The Technology Development Center has developed a power MOSFET for use in the injector drive of D4 engines, which has played an important role in the commercialization of the D4 engine. This, in turn, has contributed to environmental protection by reducing energy consumption and CO₂ emissions.

The Kyowa Plant, where the Technology Development Center is located, carries out the following activities.

Production

■ Reducing Sludge by Shifting to Coagulating Method for Waste Coolant

Waste coolant emitted during the production process is treated internally. We previously treated sludge by adding aluminum sulfate and slaked lime (calcium hydroxide), inorganic chemicals for coagulating and separating degraded emulsion and dewatering sludge. This sludge was then handled by outside parties and disposed of at landfill sites. In accordance with our

Zero Emissions targets, in fiscal 2000 we shifted to a new recovery method that involves changing to the use of organic polymer chemicals for breaking down emulsions, which are then separated and recovered as floating oil. The introduction of this process has eliminated the generation of sludge as well as the need to dispose of sludge at landfill sites.

Plant Greenery

■ Operating Earthworm Farms to Reduce Botanical Waste Materials

Greenery at the Kyowa Plant includes 39,000 square meters of lawn and approximately 300 trees. In the past, the Kyowa Plant commissioned outside waste disposers to handle and dispose of cut grass, weeds, and fallen leaves as botanical waste materials. From fiscal 2000, however, the Kyowa Plant began operating earthworm farms, where earthworms are mixed with leaf mold (humus), which has a high nutritional value, for the creation of compost. By efficiently using cut grass and other decomposing vegetation at these earthworm farms, we have reduced the amount of botanical waste generated at the plant. Also, in building our earthworm farms, we utilized used pallets to serve as enclosures.



Earthworm farm

■ Creating Humus from Fallen Leaves

In the past, every year from October to December, we commissioned outside parties to dispose of fallen leaves from zelkova trees and cherry trees. These leaves were handled as botanical waste materials. However, from fiscal 2000 we built a 16m³ enclosure, combined slaked lime, soil, and fallen leaves, and sealed off outside air to create humus. We are effectively using this humus as a soil activation agent.

Also, as part of our interaction with local communities, we distribute this humus free of charge to visitors at a summer festival at the Kyowa Plant. This humus has been highly acclaimed, and we intend to continue providing this to the public in the future.



Site for creating humus