

Production

Environmental impacts resulting from production processes vary widely, including CO₂ emissions due to the use of energy, generation of wastes, and chemical substances to be controlled.

Murata has taken every possible measure to reduce environmental impacts from our production processes.

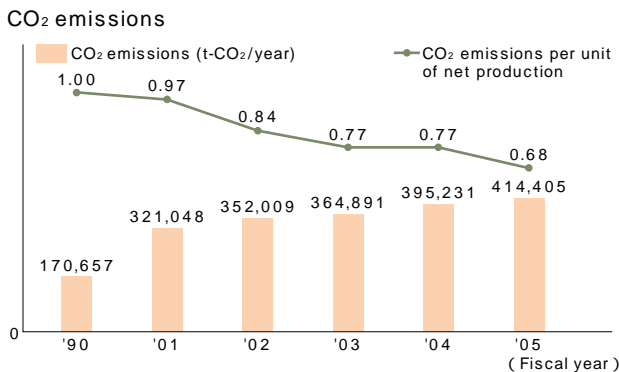
Prevention of Gloval Warming

Present Status of CO₂ Emissions

Murata actively implements initiatives to curb greenhouse gases - mainly CO₂* - that are emitted as a result of our business activities. In fiscal 2005, CO₂ emitted from our plants and subsidiaries in Japan totaled 414,405 metric tons-CO₂. In terms of CO₂ emissions per unit of net production, this is a decrease of 68% from fiscal 1990 levels.

*Murata does not emit the greenhouse gases other than CO₂

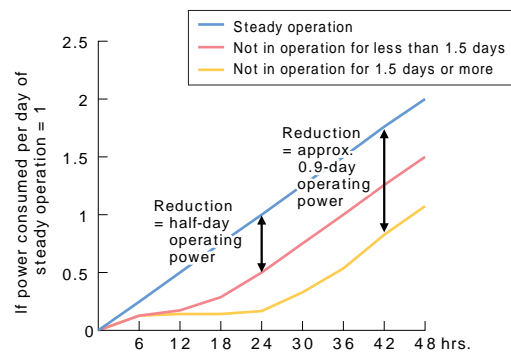
DATA CO₂ emissions (in Japan) and by area



Initiatives for Energy Conservation on Production Lines

1. Mesh belt furnaces consume large amounts of electric energy. Formerly, even on days when plants were not in operation we ran our mesh belt furnaces at the same temperature as on plant operating days. By optimizing the temperature decrease/increase profiles, we can now run the mesh belt furnaces at a low temperature on non-operating days. We also improved the conditions under which heat treatment equipment is used. These measures have enabled us to reduce CO₂ emissions by 4,766 metric tons per year.
2. We have commenced activities for energy saving in production facilities by actually measuring the energy consumption of each production facility and analyzing energy consumption by facility type.
3. Continuous efforts are also under way to design energy-saving production facilities. By introducing high-efficiency production facilities, we have reduced CO₂ emissions by 5,520 metric tons per year.

Energy-saving by improving mesh furnace operating conditions on plant non-operating days



Energy-saving Initiatives regarding General Facilities

Also as concerns general facilities, we are actively committed to energy conservation by introducing cogeneration systems and through other means. [For details, refer to page 11 and 12.]



Energy Audit (Yokaichi Plant)

Future Initiatives to Be Addressed

Murata has set itself a goal for fiscal 2010 of reducing CO₂ emissions per unit of net production in Japan by 25% compared to fiscal 1990 levels. In fiscal 2005, our Company achieved 32% reduction per unit of net production, greatly exceeding the original target. We attribute this result primarily to a high rate of capacity usage, so can't be certain of automatically attaining our target for fiscal 2010.

To ensure the achievement of our fiscal 2010 target, we horizontally communicate information on individual initiatives implemented at each office and plant, so as to share existing expertise throughout the entire Company. Moreover, we strive to further reduce CO₂ emissions through active replacement of current equipment with more energy-efficient models.

Resource Conservation and Waste Reduction

Present Status of Waste Generation

Murata is committed to recycling wastes generated at its offices and plants. In fiscal 2003, we achieved our zero emissions target* at our 21 plants and subsidiaries in Japan. Now that we've achieved our zero emissions targets, our next step is to reduce waste generation itself. To initiate that effort, Murata established the Resource Conservation & Waste Reduction Subcommittee in fiscal 2004.

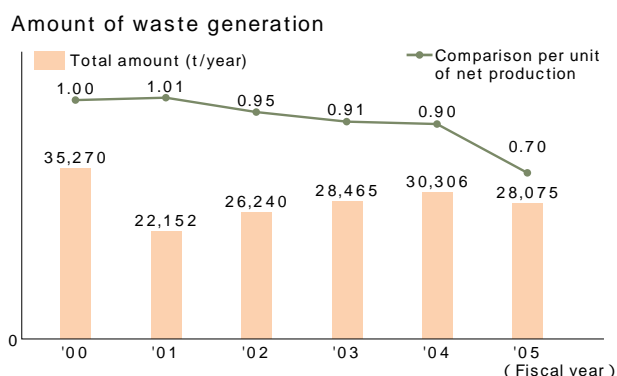
Under the Subcommittee, we also organized workshops that respectively work on the themes of reducing waste fluids, waste plastics and waste ceramics. All these types of waste are produced in large quantities, so have room for reduction.

In fiscal 2005, the amount of waste generated in our offices, plants and subsidiaries in Japan totaled 28,075 metric tons, an approximately 7,200 metric ton decrease from fiscal 2000. In terms of waste materials generated per unit of net production, this is a decrease of about 30%.

As regards the material recycling rate, in fiscal 2005 we improved the rate to 99.98% by changing the disposal method of waste formerly handled by thermal recycling.

*Murata's definition of zero emissions:
Defined as zero direct landfilling of waste as well as zero landfilling of waste matter remaining after intermediate treatment (i.e., 100% recycling rate). However, Murata's zero emissions and recycling rate targets exclude waste matter that the Company is unable to process on its own, such as excess sludge in remediation tanks.

DATA Amount of waste generation (in Japan)



Reducing Waste Acid/alkali and Waste Plastics

Of all the types of wastes generated at Murata, waste fluids and waste plastics are particularly large in quantity, comprising approximately 70%. Therefore, our efforts to reduce waste generation focus particularly on these types of wastes.

In fiscal 2005, our Yasu Plant worked to reduce waste fluids, successfully reducing them by about 120 metric tons/month.

Moreover, Fukui Murata Manufacturing Co., Ltd. and Izumo Murata Manufacturing Co., Ltd. installed additional peeling processors to recycle film adhering to ceramic waste produced during the manufacturing process. This enabled us to recycle annually about more than 1,200 tons of PET film into raw material for making chemical fibers and other products.



Evaporator of concentrator for alkaline and acid waste liquids

Sharing of Information on Waste Reduction

To promote waste reduction and improve recycling levels, Murata regularly organizes meetings among staff in charge of waste management in respective plants, offices and subsidiaries. At these meetings, participating members exchange views, share information and conduct other activities noted below:

- Inspections of waste management carried out at each plant, office and subsidiary
- Presentations and information sharing on cases of waste reduction
- Exchange of views among staff in charge of waste management
- Lectures on the latest in waste management by experts invited from outside the Company

DATA Recycling rate (in Japan)



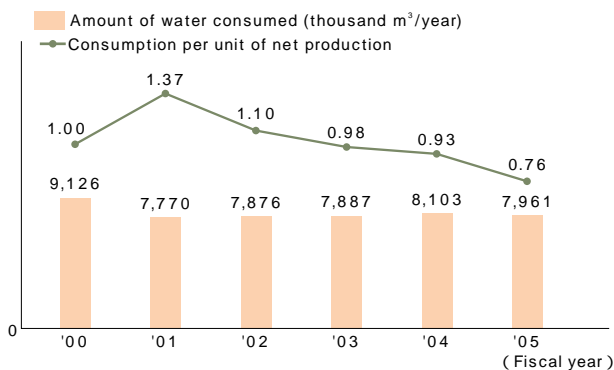
Meeting to discuss waste reduction (Sabae Murata Manufacturing Co., Ltd.)

Reducing Water Consumption

In focusing our attention on plants and processes that consume large amounts of water, we are promoting the cyclic use of groundwater by various means. For example, we reuse cooling water for vacuum pumps by re-cooling it with heat exchangers. Consequently, in fiscal 2005 the amount of water consumed at our offices, plants and subsidiaries in Japan was 7.96 million m³, a reduction of 1.17 million m³ from fiscal 2000.

DATA Water consumption (in Japan)

Water consumption



Management and Reduction of Environmentally Hazardous Substances in Production Processes

Among the various chemical substances used in Murata's production processes, those with hazardous properties are strictly managed, from procurement and use to release. We are also actively working to reduce the use and release of these chemical substances to ensure that we can minimize their environmental impact during our production activities.

Management of Environmentally Hazardous Substances

Murata has established a system that requires prior registration of chemical substances to be used in mass production. By linking this registration system with Murata's material procurement system, we perform chemical monitoring to prevent the purchase of unregistered chemical substances. The registered information is also used to ensure the appropriate management of chemical substances and the reduction of environmentally hazardous substances.

The Japanese Pollutant Release and Transfer Register (PRTR) Law stipulates 354 substance groups subject to reporting. Of these substance groups, the Murata Group handled more than 1 metric ton of 24 different substance groups, including toluene and xylene, in Japan in fiscal 2005.

DATA Pollutants Released and Transferred Subject to the PRTR Law (Total for Japan)

Reduction of Environmentally Hazardous Substances

Among the chemical substances used in our production processes, those with the potential to greatly affect the environment are subject to Murata's unique voluntary regulation program, which was established in 1997. We continue to target the reduction and elimination of substances specified in our voluntary regulation program. Under the program, chemical substances are ranked according to their degree of hazard. The program stipulates prohibition or reduction of 157 substance groups in total.

DATA Voluntary regulation program for environmentally hazardous substances to be used or released in production process

Reducing Atmospheric Release of VOCs

As a result of the amendment of Japan's Air Pollution Control Act, beginning in April 1, 2006, enterprises engaged in business activities that release and disperse volatile organic compounds (VOC) are required to track and reduce VOC emissions.

In fiscal 2005, Murata installed regenerative thermal oxidizers (RTOs) at its Yasu and Yokaichi Plants. With introduction of these RTOs, which commenced operation in fiscal 2006, we expect to curtail VOC atmospheric release by more than 200 metric tons annually. Murata has installed a total of nine RTOs, including the above-mentioned two units. This exemplifies the Company's voluntary efforts to actively reduce atmospheric release of VOC, even prior to legislation implementation.

DATA Atmospheric Release of Major Substances Subject to PRTR (toluene and xylene)



Regenerative thermal oxidizer (RTO)

Dealing with Environmental Risk

We are aware that among the various potential environmental risks involved in Murata's activities, chemical contamination is of particular concern. The Murata Group works to prevent such risks by taking countermeasures, including facility preparation and employee training. We also promote initiatives to reduce other environmental risks, such as waste and related problems.

Countermeasures to Prevent Contamination by Chemical Substances

We are preparing facilities intended to eliminate any impact on the surrounding environment in order to minimize potential environmental risks of Murata's business activities, particularly in the event of accidents. With special consideration for the scale and period of impact, we have established the following four voluntary standards for storing and transporting chemical substances within plant facilities.

1. **Prohibition against Underground Storage Tanks**
In principle, storage tanks for fuels, organic solvents, acids, alkalis and waste liquids; and wastewater tanks for treating wastewater shall be located above ground. If it is unavoidable that a tank be placed underground due to legal requirements, it shall be a double-walled tank.
2. **Permeation Barrier Coating**
Locations where fluids such as fuels, organic solvents, acids, and alkalis as well as waste oil are handled shall be provided with a bed made of a permeation barrier coating or stainless steel.
3. **Prohibition against Underground Piping**
Pipes for transporting fluids such as fuels, organic solvents, acids and alkalis as well as waste liquids shall be located overhead.
4. **Emergency Containment Structure**
Workplaces where liquids are received or where waste liquids are discharged to or from tank trucks or the like shall have a structure for immediately containing any leakage should an accident occur.

Scheduled Monitoring Industrial Waste Disposal
Murata's plants and subsidiaries entrust the disposal of industrial wastes to licensed specialist companies. At fixed intervals we inspect their disposal sites in Japan and overseas, to ensure proper disposal.



Inspection of industrial waste disposal company

Training for Proper Emergency Measures in the Event of an Accident

To minimize environmental risks in the event of a natural disaster or serious accident, we regularly implement training for employees to deal with such emergencies.

Environmental Accidents and Complaints

Should a serious environmental accident or complaint arise, employees are mandated to immediately address it and report to the Head Office of Murata Manufacturing, so that we can share the reported information and implement horizontal countermeasures to prevent similar accidents from occurring at subsidiaries. In fiscal 2005, there were no significant accidents or complaints related to environmental issues.

Remediation of Soil and Groundwater Contamination

To clean up soil and groundwater contamination generated by Murata's past business activities, Murata has undertaken surveys and countermeasures ahead of other companies. We are actively implementing measures targeting early stage completion of the remediation (decontamination), by taking steps toward eliminating the use of chlorinated organic solvents such as trichloroethylene. To be more specific, by the time groundwater permeation was prohibited according to the terms of the 1989 Water Pollution Prevention Law, 17 of Murata's 22 production plants and subsidiaries had already ceased using trichloroethylene. Furthermore, by 1998, use of the five specified types of chlorinated organic solvents including trichloroethylene had been eliminated throughout the Company.

In 1991, Murata introduced up-to-date technology to voluntarily undertake detailed surveys of soil and groundwater contamination in all plants and subsidiaries. As a result of this effort, it was concluded that 14 of the Company's 36 plants and subsidiaries had to institute remediation measures to remove contamination by chlorinated organic solvents.

Our Efforts to Promote Remediation

With the aim of completely remediating soil and water contamination at the earliest possible date, our plants and subsidiaries with relatively high pollution densities are actively implementing new remediation measures through the application of new technologies, in addition to ongoing remediation measures.

We had accelerated remediation at seven sites by fiscal 2005. For each site, we use one of three different remediation methods: the On-site Bio Method, the On-site Iron Powder Method or the On-site Oxidation and Decomposition Method, depending on soil properties and the density and source of contamination.

On-site Bio Method

This method decomposes chlorinated organic solvents by injecting nutrients into the groundwater, in order to cultivate microbes present in the soil under anaerobic conditions.

On-site Iron Powder Method

Soil and iron powder are mixed on-site. The reducing power of metallic iron deoxidizes, decomposes, and renders harmless chlorinated organic solvents in soil.



On-site Iron Powder Method

On-site Oxidation and Decomposition Method

This is an oxidation and decomposition method using potassium permanganate. This method entails the direct injection of hydrogen peroxide into the groundwater, which directly oxidizes, decomposes and renders harmless various chlorinated organic solvents.



On-site Oxidation and Decomposition Method

State of Groundwater Remediation

At 14 polluted sites that were deemed in need of remediation as a result of Murata's own survey, we drilled wells along the borders of the sites so as to measure data on trichloroethylene and cis-1,2-dichloroethylene. By fiscal 2005, we completed cleanup on two plants, and stopped operation of the remediation equipment at one plant, which is now in the stage of confirming the cleanup completion. Although there are still fluctuations within the allowable range at some plants and subsidiaries, the pollution level has been on a downward trend in general, and our cleanup efforts are progressing.

DATA State of groundwater remediation

Allocating Reserves to Cover All Remediation Costs

Completion of all remediation (decontamination) measures entails very high countermeasure costs. For business accounting purposes, Murata has carried out a trial calculation of the full cost of remediation measures to ensure that all contamination has been removed.

DATA Soil and groundwater remediation costs