

Environmental Reporting

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Reducing of Environmental Load

Control on Emission of Chemical Substances

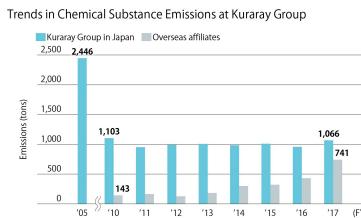
Based on the Law Concerning Reporting, etc. of Pollutant Release and Transfer Register (PRTR Law), the Kuraray Group in Japan checks, records and reports relevant chemical substances to the national government of Japan. The Kuraray Group similarly discloses on its official site, etc. emissions of chemical substances not only covered by the PRTR Law, but also designated by the Japan Chemical Industry Association (JCIA). In addition to them, persistent organic pollutants (POPs), volatile organic compounds (VOCs), hazardous atmospheric pollutants (HAPs) and particulate matter (PM) are considered to be chemical substances and Kuraray is taking action as explained in the table.

[> Previous year on the website](#)

Classification	Chemical substances	Actions to be taken
POPs	Polychlorobiphenyl (PCB)	Storing, managing, reporting and processing to render harmless in accordance with the Law Concerning Special Measures against PCB Waste. (Fiscal 2027 is set as a time limit for harm-free processing)
	Dioxin and the like	Emissions are measured for each plants and other business units (Please visit Kuraray website)
	Substances other than the above	Not applicable to Kuraray manufacturing and use
VOC HAP		Included as substances in the pollutant release and transfer register (PRTR) and emissions are measured and reported as PRTR substances. (Please visit Kuraray website for emissions by each plant)
PM		Emissions of particles of soot are reported in Material Flow
PRTR		Emissions of substances applicable to the law and to the list compiled by the Japan Chemical Industry Association are measured and reported (Please visit Kuraray website for emissions by each plant)

Classification	Chemical substances	Actions to be taken
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In fiscal 2017, emissions of PRTR substances* of the entire Kuraray Group in Japan totaled 1,066 tons (982 tons into the atmosphere and 84 tons into water areas). The environmental efficiency of the Kuraray Group in Japan improved by 20.1% compared with fiscal 2010. Even though the production volume has increased, we took measures not to increase emissions such as by changing the production process from an organic solvent system to a water system.



The emissions of the Kuraray's affiliates outside Japan show an increasing trend because we incorporated new business through M&As and the capacity utilization of new production sites rose. However we are working to control emissions while complying with the strict regulations for chemical substances of each country. Emissions of the Kuraray's affiliates outside Japan totaled 741 tons in fiscal 2017.

* Substances subject to the PRTR Act and substances designated by the Japan Chemical Industry Association

Reduction and Effective Use of Waste, and Reduction of Landfill Waste

Since fiscal 2007, the Kuraray Group in Japan has been maintaining “an effective utilization rate of waste of 90% or higher, and final landfill disposal rate of 1% or lower.” In fiscal 2017 also, these rates were maintained and the effective utilization rate was 96.2% and final landfill disposal rate was 0.37%. Environmental efficiency of fiscal 2017 improved from the previous year, recovering a level that was unchanged from that of fiscal 2010. Waste generation of the Kuraray Group in Japan had shown an increasing trend for the past few years due to the increase in production volume. However, as a result of the continuous efforts made by plants and affiliates to maximally reduce waste generation such as by improving product yields and the combustion efficiency of off-grid power systems, waste generation for fiscal 2017 was successfully reduced compared with fiscal 2016. Almost all of the waste generated is recycled into material or thermal resources and this means we maintained the rate of beneficial use of waste at a high level. Through this activity, we are taking care not to affect the external environment.

On the other hand, the production volume of Kuraray's affiliates outside Japan is largely increasing because we are incorporating new businesses through M&A (the volume tripled compared with fiscal 2010 including the raw material of Poval resin). The volume of waste generation also tripled in the same period in spite of us making reducing efforts. For this reason, Environmental efficiency decreased by 31.6% compared with fiscal 2010. We will continue to work on watching future trends and taking reducing measures such as by optimizing the operating conditions and recycling materials.

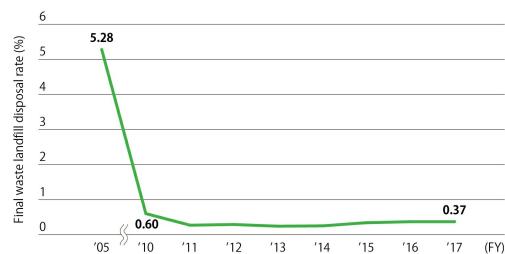
The reason why the amount of waste generation of the Kuraray's affiliates outside Japan is very small compared with the Kuraray Group in Japan is that the utilities such as electricity are purchased from suppliers outside Japan and that wastewater treatment is outsourced to outside disposal companies so that soot and incineration residue from boilers and sludge from wastewater treatment facilities are not generated physically.



Trends in Waste Effective Utilization Rate at Kuraray Group in Japan



Trends in Final Waste Landfill Disposal Rate at Kuraray Group in Japan



Effective Utilization of Water Resources

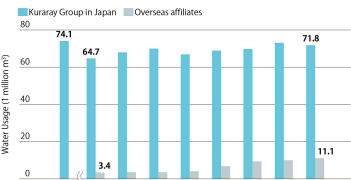
The Kuraray Group, including its affiliates outside Japan, is not engaged in production activities in areas in which water resources are scant and their business activities affect water sources of such areas.

The volume of water intake (except seawater) of the Kuraray Group in Japan totaled 71.8 million m³ per year. Some Kuraray plants in Japan are continuously reusing water such as by recycling thermal resources from hot waste water and cooling water for boiler operation.

Even though Kuraray plants in Japan are located in good places in terms of water resources, we believe that it is necessary to conduct business activities by considering the long-term prospects of a water supply such as risk of a water shortage caused by climate change due to global warming. We will keep track of water consumption trends while continuously reducing our water consumption.

Since fiscal 2014, the water consumption of the Kuraray's affiliates outside Japan has been increasing because we have incorporated new businesses through M&As. For example, there has been an increase in the self-manufacturing ratio of the raw material of Poval resin. As a result, Environmental efficiency decreased by 40.7% compared with fiscal 2010.

Trends in Water Usage at Kuraray Group



Conservation of Biodiversity

Kuraray formulated the Action Policy for Biodiversity Conservation and has been promoting activities and the development of technologies and sales of products that contribute to biodiversity conservation. For example, employee volunteers at each Kuraray plant engage in

forest conservation activities in cooperation with local governments and NPOs, and planting activities on Mt. Fuji. We also gained type approval certification from the Japanese government on May 30, 2012 for MICROFADE, a ballast water* management system, and have promoted sales in earnest. The International Convention for the control and management of Ships' Ballast Water and Sediments which came into effect in 2017 requires ballast water treatment equipment to be installed on all internationally operated vessels in sequence. Our MICROFADE's ability to clean ballast water has been attracting attention for its potential contribution to biodiversity conservation.

* Ballast water, consisting of seawater that is drawn into ballast water tanks in order to maintain balance on cargo ships after unloading cargo, is often taken from a port in one country and is discharged at a port in another. The resulting disruption of local ecological systems following the introduction of foreign plant and animal species contained in ballast water has become an international problem.

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