

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](#)

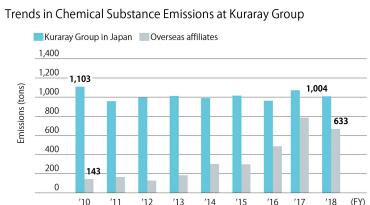
Classification	Chemical substances	Actions to be taken
POPs	Polychlorobiphenyl (PCB)	Storing, managing, reporting and processing to render harmless in accordance with the Law Concerning Special Measures against PCB Waste. (Fiscal 2027 is set as a time limit for harm-free processing)
	Dioxin and the like	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. (Reported in Material Flow. Please visit the Kuraray website for emissions by each plant)
PM		Emissions of particles of soot are reported in Material Flow

Classification	Chemical substances	Actions to be taken
PRTR		Emissions of substances applicable to the law and to the list compiled by the Japan Chemical Industry Association are measured and reported (Reported in Material Flow. Please visit the Kuraray website for emissions by each plant)

In fiscal 2018, emissions of PRTR substances* of the entire Kuraray Group in Japan totaled 1,004 tons (925 tons into the atmosphere and 79 tons into water areas). As a result, they have gone down in comparison with fiscal 2017, but have not yet reached the figures achieved in fiscal 2016 (less than 957 tons) set as a target in our Mid-term Plan.

The emissions of the Kuraray group companies outside Japan showed an increasing trend up to the previous fiscal year because we incorporated new business through M&As and the capacity utilization of production sites rose. However, we are working to control emissions while complying with the strict regulations for chemical substances of each country. As a result, the emissions of Kuraray group companies outside Japan totaled 633 tons in fiscal 2018.

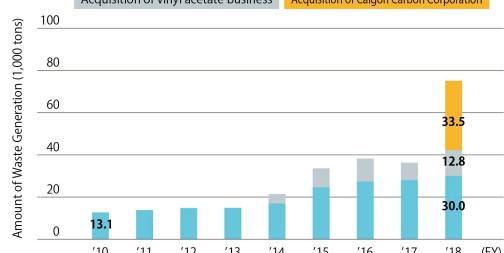
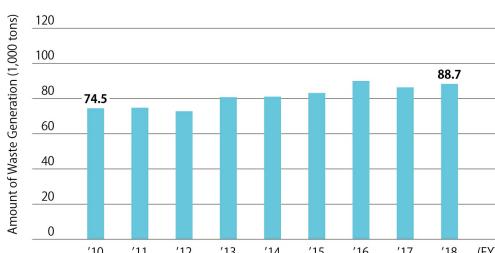
* Substances subject to the PRTR Act and substances designated by the Japan Chemical Industry Association



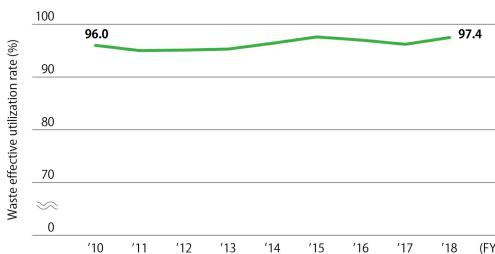
Reduction and Effective Use of Waste, and Reduction of Landfill Waste

Since fiscal 2011, the Kuraray Group in Japan has been maintaining “an effective utilization rate of waste of 95% or higher, and final landfill disposal rate of 0.5% or lower.” In fiscal 2018 also, these rates were maintained and the effective utilization rate was 97.4% and final landfill disposal rate was 0.37%. Waste generation of the Kuraray Group in Japan increased slightly compared with fiscal 2017 due to the increase in production volume. However, as a result of the continuous efforts made by plants and group companies to maximally reduce waste generation such as by improving product yields and the combustion efficiency of off-grid power systems, waste generation was reduced by 2,327 tons in fiscal 2018, and we achieved our target, making a reduction of at least 1% (900 tons) compared to the generated amount in 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. The landfill disposal amount in fiscal 2018 was 330 tons, which did not reach our target amount of the results from fiscal 2016 (less than 251 tons). However, our non-effective use volume (landfill and simple incineration) including landfill disposal was 2,319 tons (this volume was 2,637 tons in fiscal 2017).

At our overseas group companies on the other hand, business expansion due to the incorporation of new business through M&As has led to an increase in the amount of generated waste. We are progressing in activities to enhance yield rate and improve our intensity index. We will continue implementing reducing measures such as by optimizing the operating conditions and recycling materials.



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

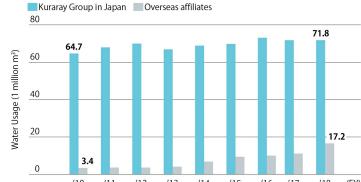
The Kuraray Group including its overseas group companies is not engaged in production activities in areas in which water resources are scant and where our business activities significantly affect the water sources of such areas. However, there is pressing demand for water resources worldwide, and we will continue engaging in corporate activities while recognizing these resources as being vital.

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. In particular, we have started preparations to switch to the industrial water supply from Kurashiki city, because of the construction work at Takahashi River to prevent flooding, it will be impossible for Kurashiki Plant to take water from the river. The maximum water supply rate will be lower than previously, and so we will engage in initiatives to use water resources more effectively than ever before. We will keep track of water consumption trends while continuously reducing our water consumption.

Since fiscal 2014, the water consumption of the Kuraray overseas group companies has been increasing because we increased the self-production amount of raw material of poval resin and incorporated new businesses through M&A like an acquisition of Calgon Carbon Corporation. The water (except seawater) intensity index (excluding Calgon Carbon

Trends in Water Usage at Kuraray Group



Corporation for the sake of comparison with fiscal 2017) improved by 24.3 percentage points, and thus we achieved our target of improving by one percentage point compared with the previous year. This result was greatly impacted by implementing measures at some sites where we adopted a new system of exhaust gas processing equipment using a small amount of water instead of using a considerable volume of water.

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 its sales. 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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