

Management of pollution including waste

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Measures to prevent pollution

Hamamatsu Photonics works hard to prevent pollution. Our production facilities, most of which are located in Japan, use a range of chemicals in their manufacturing processes, some of which are specified chemicals with the potential to pollute the environment. Under Japanese law, all transfers and emissions of these chemicals must be reported to the government through the Pollutant Release and Transfer Register (PRTR) system. We appropriately report to the competed authority based on the data which stem from the chemical usage survey conducted twice a year.

The chemicals used at our sites are managed through the surveys of chemical use described above, as well as through Green Procurement Management Standard for Chemical Substances For HAMAMATSU Group^{*1}. These substances are controlled especially carefully during the disposal phase. Japan's Environmental Basic Act lists seven typical forms of pollution that can be harmful to human health and living environments: (1) Air pollution, (2) Water pollution, (3) Soil pollution, (4) Noise, (5) Vibration, (6) Land subsidence, and (7) Odor. At Hamamatsu Photonics, we manage all these forms of pollution according to the law and our own standards from the perspective of preventing accidents that can cause pollution. When the possibility of pollution from our business activities arises, we move promptly to identify the source of the pollution, report the matter to the competent authorities and local communities and strive to return conditions to their original state.

^{*1} Green Procurement Management Standard for Chemical Substances For HAMAMATSU Group: Hamamatsu Photonics' in-house standards applying to substances the Company designates as the Environment-related Substances. We also have the Green Procurement Management Standard for Chemical Substances For Suppliers which sets the same level of criteria as the standard for HAMAMATSU Group sets, which focuses on chemicals contained in products/parts supplied by suppliers and is opened to the public.

Note: The data tabulation period is based on the Company's fiscal year.

FY2021: October 1, 2020 to September 30, 2021
FY2020: October 1, 2019 to September 30, 2020
FY2019: October 1, 2018 to September 30, 2019
FY2018: October 1, 2017 to September 30, 2018
FY2017: October 1, 2016 to September 30, 2017

Appropriate management of chemicals

Twice a year, Hamamatsu Photonics conducts a survey of the status of chemical use, to gain an understanding of the full extent of its use of chemicals in manufacturing processes and the like. Among these are Class I specified chemicals^{*2} as designated in the PRTR system. When chemicals of this type are handled by the Company in quantities of 1 t per year or more, they become subject to reporting. In 2020 the Main Factory and Miyakoda Factory reported the use of 4 such chemicals. The chemicals reported by Hamamatsu Photonics, the volume of Class I specified chemicals handled in each fiscal year^{*3}, and their output per unit of net sales are as shown below. In FY2021, Volume handled was increased than previous fiscal year because of production increased. On the other hand, volume handled per unit of net sales was same level as previous fiscal year because net sales increased.

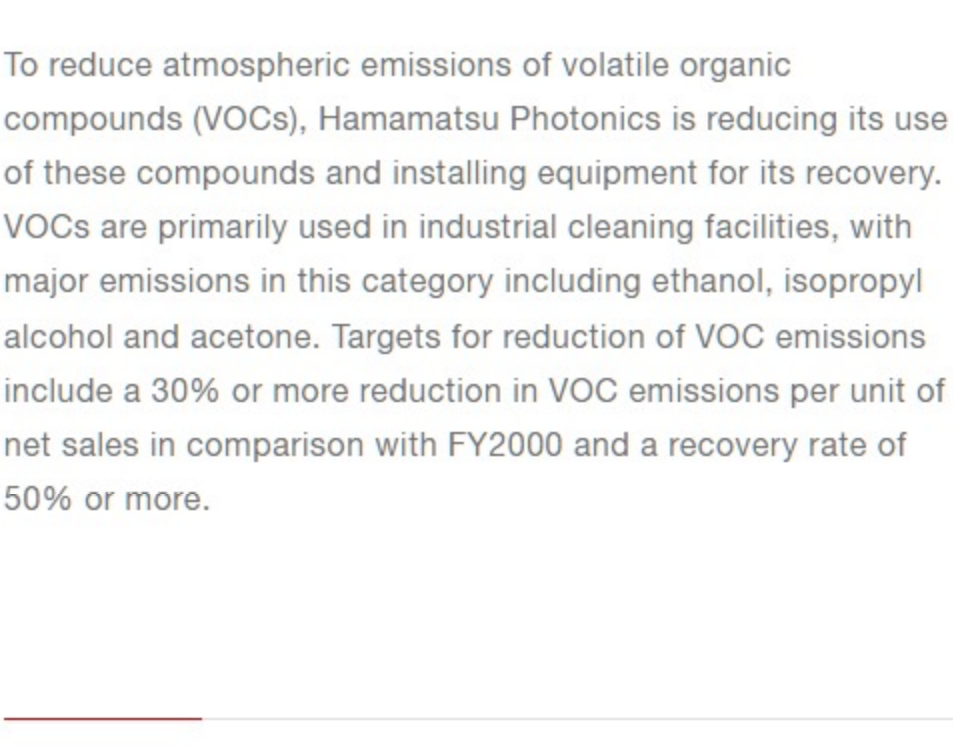
^{*2} Chemicals for which both submission of the volume released into the environment under the PRTR system and provision of safety data sheets (SDSs) are required. As of January 2022, 462 substances are designated as Class I specified chemicals.

^{*} https://www.meti.go.jp/policy/chemical_management/law/prtr/2.html

^{*3} Chemicals of this type used by any of the Company's business locations in quantities of over 1 kg per year are subject to tabulation.

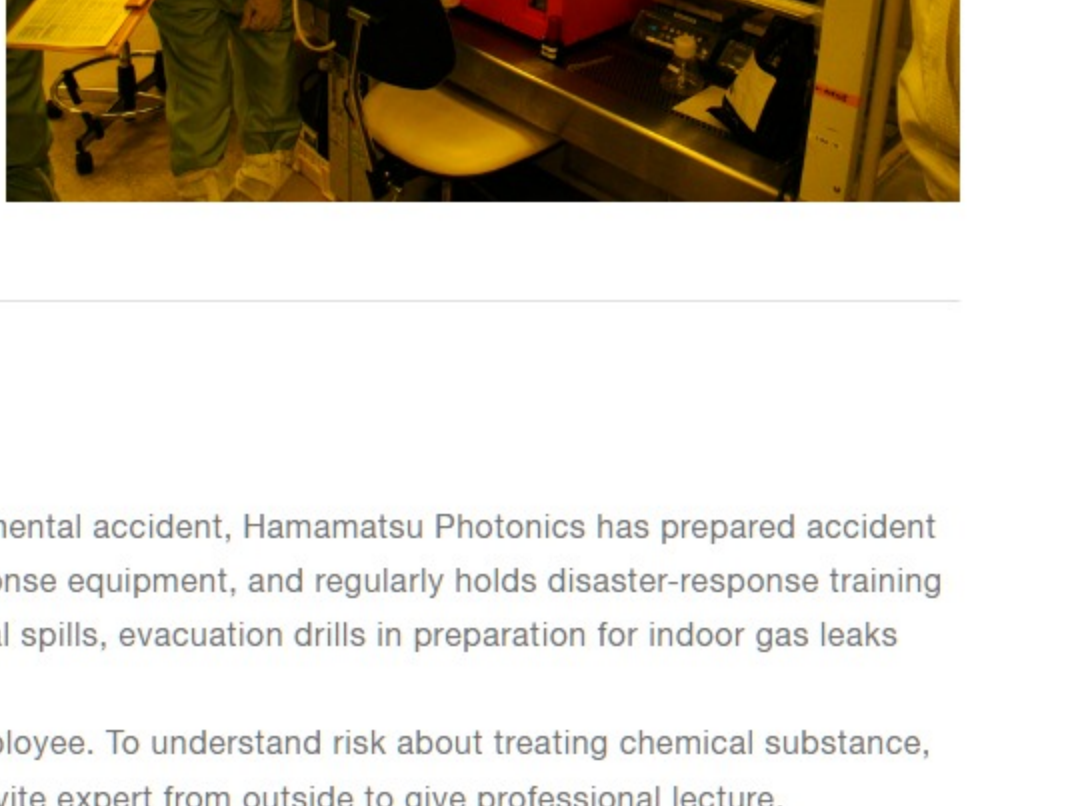
Substances subject to reporting based on the PRTR system

	FY2016	FY2017	FY2018	FY2019	FY2020
Toyooka Factory	-	-	-	-	
Tenno Glass Works	-	-	-	-	
Main Factory	1. 2-amino ethanol 2. Hydrogen fluoride and its water-soluble salts	1. 2-amino ethanol 2. Hydrogen fluoride and its water-soluble salts	1. 2-amino ethanol 2. Hydrogen fluoride and its water-soluble salts 3. Pyrocatechol	1. 2-amino ethanol 2. Hydrogen fluoride and its water-soluble salts 3. Pyrocatechol	1. 2-amino ethanol 2. Hydrogen fluoride and its water-soluble salts 3. Pyrocatechol
Mitsue Factory	-	-	-	-	
Shingai Factory	-	-	-	-	
Joko Factory	-	-	-	-	
Central Research Laboratory	-	-	-	-	
Miyakoda Factory (Compound semiconductor Fabrication Center)	-	-	Ferric chlorides	Ferric chlorides	Ferric chlorides
Industrial Development Research Center	-	-	-	-	
Tsukuba Research Center	-	-	-	-	



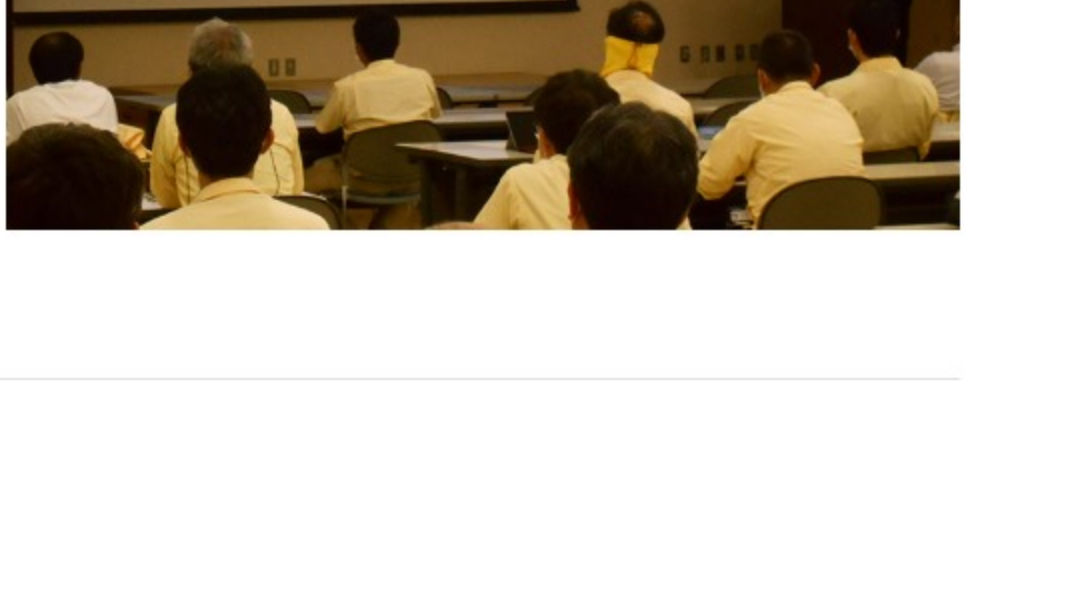
Advancement of collection and use of SDSs

SDSs are useful for understanding the properties of chemicals and handling them safely. Hamamatsu Photonics ensures that the latest SDSs not only for chemicals for which provision of SDSs is required under the Industrial Safety and Health Act but for all chemicals it handles. SDSs are recorded in the Company's database, playing a role in risk assessment of chemicals and in maintaining the safety of workplaces and the surrounding environment.



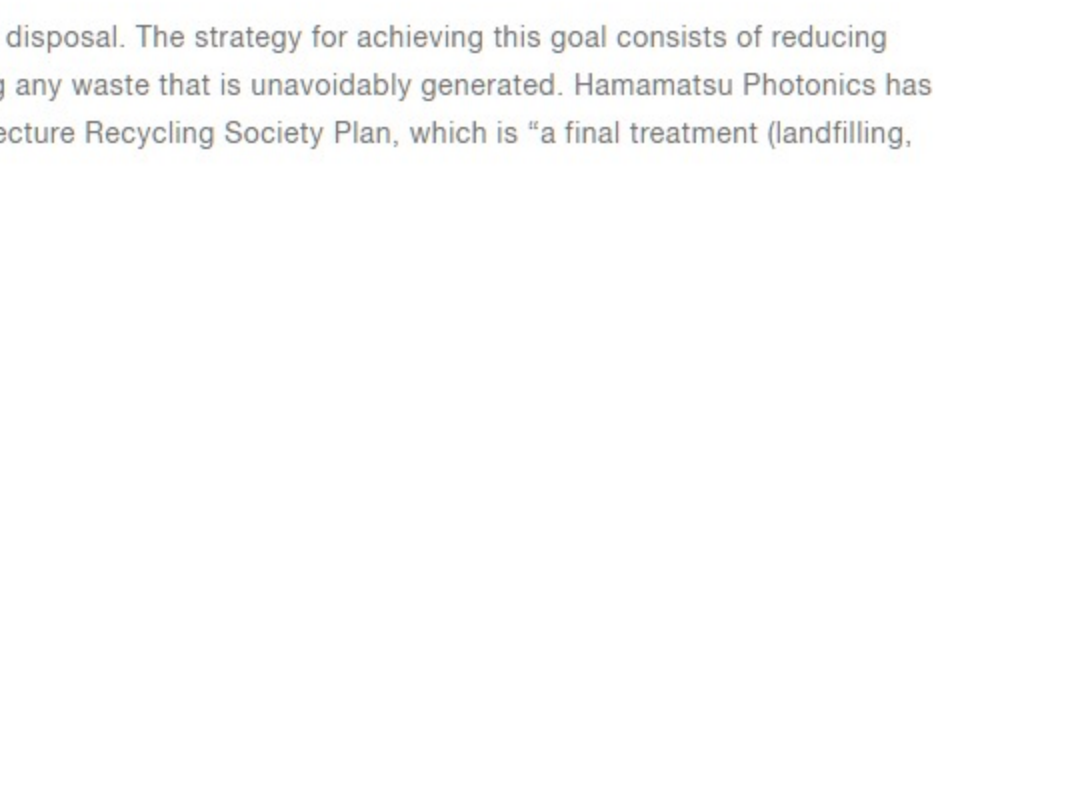
Reducing atmospheric emissions of VOCs

To reduce atmospheric emissions of volatile organic compounds (VOCs), Hamamatsu Photonics is reducing its use of these compounds and installing equipment for its recovery. VOCs are primarily used in industrial cleaning facilities, with major emissions in this category including ethanol, isopropyl alcohol and acetone. Targets for reduction of VOC emissions include a 30% or more reduction in VOC emissions per unit of net sales in comparison with FY2000 and a recovery rate of 50% or more.



Inspection of status of handling of chemicals

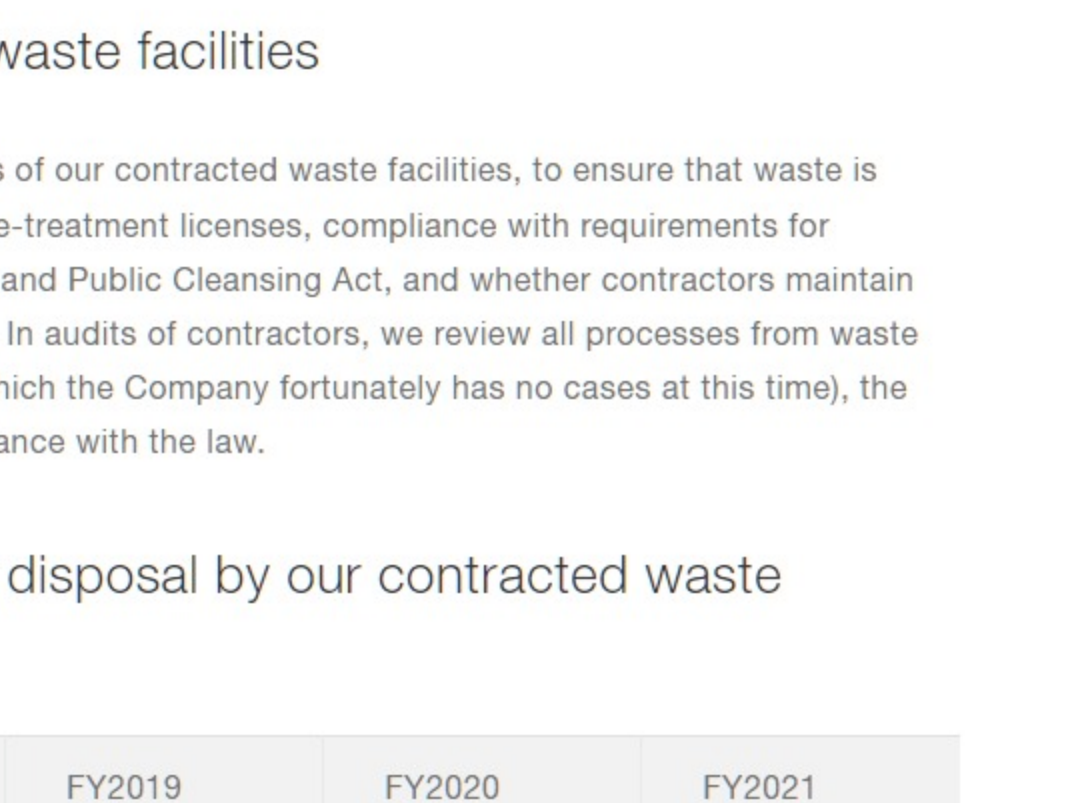
While evaluation of risks associated with chemicals is based on SDSs, the actual degree of risk is heavily dependent on the environment in which chemicals are used. At Hamamatsu Photonics, we regularly inspect the workplaces and chemical storage sites where chemicals are handled, under the Chemicals Working Group. When problems are detected through the inspection process, we correct them promptly, then report the matter to the Headquarters Chemicals Working Group and share the information appropriately.



Chemical safety training

To ensure employees treat chemicals properly and prevent environmental accident, Hamamatsu Photonics has prepared accident and disaster response manuals, installs and inspects disaster-response equipment, and regularly holds disaster-response training sessions. Training sessions include training on response to chemical spills, evacuation drills in preparation for indoor gas leaks and training on respirator tank attachment.

We also regularly hold chemical safety educational program for employee. To understand risk about treating chemical substance, we share internal/external chemical substance accident cases or invite expert from outside to give professional lecture.



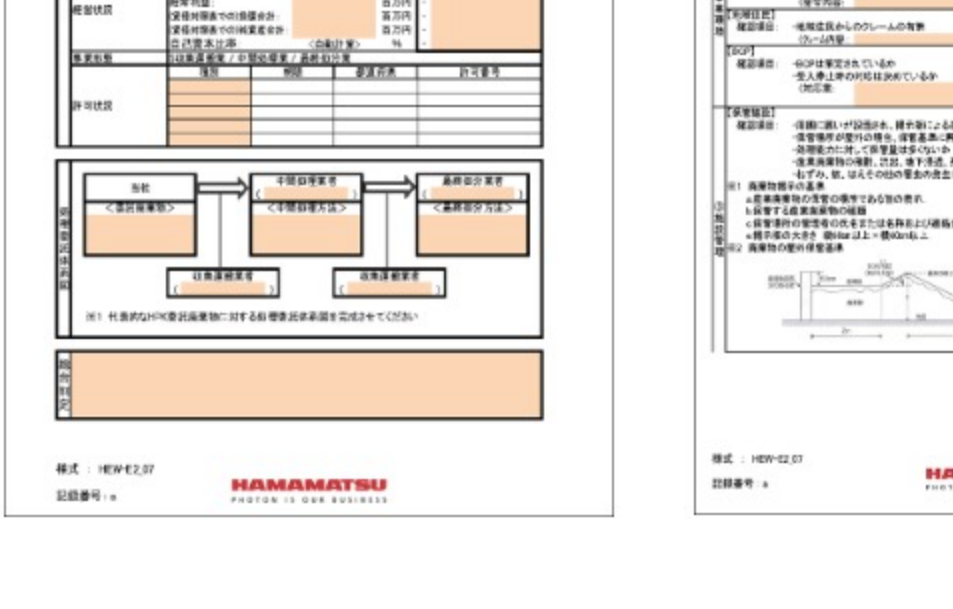
Appropriate waste management

Striving for zero emissions

Based on the appropriate waste treatment as the basic policy, we have been managing wastes properly to achieve the idea of zero emissions^{*4}, to reduce their negative impact on the environment and use resources efficiently. For fiscal year 2020, we recorded the landfill rate^{*5} of 0.2 % and achieved zero emissions. This was accomplished by separating and reducing wastes, reducing inferior goods, reusing equipment and packaging materials and promoting recycling.

^{*4} "Zero emissions" is the approach of striving for a society with zero waste disposal. The strategy for achieving this goal consists of reducing resources used and waste generated in production processes while recycling any waste that is unavoidably generated. Hamamatsu Photonics has achieved zero emissions according to the definition in the 3rd Shizuoka Prefecture Recycling Society Plan, which is "a final treatment (landfilling, etc.) rate of less than 1.8%, including waste acid and waste alkali."

^{*5} Landfill rate: Landfill volume in proportion to waste volume



	FY2017	FY2018	FY2019	FY2020	FY2021
Output volume	1,168	1,194	1,301	1,292	1,491
Industrial waste	(494)	(550)	(541)	(549)	(618)
Hazardous waste ^{*6}	(235)	(271)	(315)	(307)	(404)
General waste	(141)	(123)	(152)	(149)	(152)
Valuables	(298)	(251)	(293)	(287)	(317)
Recycling volume ^{*7}	873	914	1,050	1,077	1,250
Landfill volume	8.7	4.6	6.3	2.7	3.7

^{*6} Waste designated in law as specified hazardous waste. These include sludge, waste acid, and waste alkali, all containing heavy metals, organic chlorides, and dioxin above a certain concentration. Also included are PCBs, asbestos, and waste mercury.

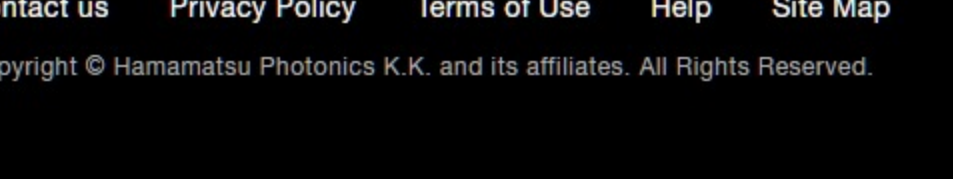
^{*7} The amount of recycling is the total amount of material and thermal recycling added to the amount of valuable materials.

Ensuring proper disposal at our contracted waste facilities

Each year Hamamatsu Photonics carries out comprehensive checks of our contracted waste facilities, to ensure that waste is disposed appropriately. We confirm the details of contractors' waste-treatment licenses, compliance with requirements for treatment and storage of waste as stipulated in the Waste Disposal and Public Cleansing Act, and whether contractors maintain harmonious relationships with surrounding residential communities. In audits of contractors, we review all processes from waste transport to landfilling. If incorrect treatment occurs (an event for which the Company fortunately has no cases at this time), the Company reports the matter to the competent authorities in accordance with the law.

Number of confirmations of status of proper disposal by our contracted waste facilities

	FY2017	FY2018	FY2019	FY2020	FY2021
Number of confirmations	17	21	23	19	24



Appropriate disposal of hazardous waste

Certain industrial wastes are identified as Hazardous Waste in several laws and regulations.⁵ These kinds of wastes require special attention and needs to be disposed of properly. We have entrusted contractors whose facilities provide disposal in an environmentally sound manner. We then confirm this with a follow up visit at these sites on a regular basis. Especially, we strictly manage PCB waste, because it must be disposed until the legally set deadline.

Preventing pollution of soil and groundwater

Hamamatsu Photonics' manufacturing processes include processes in which waste liquids containing hazardous substances are emitted. If the piping that conducts this waste liquid becomes damaged or cracked, resulting in leaks of hazardous substances, pollution of soil or groundwater can result. A revision of the Water Pollution Control Act mandates that even piping buried underground must be inspected for leaks. In light of the risk of pollution with even greater concern, we exhume underground piping and tanks and place them above ground if necessary. In addition, in view of the high incidence of earthquakes in Japan, we introduce flexible piping in certain places to prevent damage to piping due to vibration.

Placement of buried piping above ground and introduction of flexible piping

