

## Kashima Factory

Location: 26 Sunayama, Kamisu-shi, Ibaraki 314-0255, Japan  
 Number of employees: 81  
 Total site area: 101,000m<sup>2</sup>  
 Main products: Produced by Tokuyama Corporation  
 Bulk pharmaceuticals for stomach and duodenal ulcer treatment drugs, and diabetes drugs; optical materials (plastic lens monomer, light modulating materials, and hard coating solutions); raw materials for electronic materials; metal cleaners  
 Produced by Tokuyama Dental Corporation  
 Dental materials (restorative materials, adhesives, relining materials, impression materials and investment materials)



Yoshiyuki Kitajima  
Kashima Factory General Manager



The Kashima Factory strives to recycle waste matter while placing the utmost importance on the proper management and handling of chemical substances. As a result of this approach, the factory achieved an 78% effective utilization rate of waste in fiscal 2016. Waste sent to landfills for final disposal amounted to 9 metric tons. "Zero emissions" amounted to 99%. Looking ahead, the Kashima Factory is examining the feasibility of material and thermal recycling as it works to increase its effective utilization rate for all types of waste matter.

### Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Industrial water consumption	Thousand metric tons	76	51	48	43	36
Effluent discharged	Thousand metric tons	96	66	63	54	50
COD level	Metric tons	4	3	3	2	2
PRTR-designated substance emissions	Metric tons	1	2	2	2	2
Waste generated	Metric tons	930	919	1,020	735	775
Waste sent to landfills	Metric tons	7	7	11	20	9
Energy consumption*	Thousand gigajoules	59	36	36	33	37
CO <sub>2</sub> emissions (originating from fossil fuel)*	Metric tons	2,399	2,476	2,465	2,246	2,670
Complaints	Cases	0	0	0	0	0

\* In accordance with a revision of Japan's Act on the Rational Use of Energy, figures based on calorific values and other factors have been recalculated retrospectively to 1990.

### Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal

Unit: metric tons

Substance Name	Regulatory Number	Amount of Emissions				Amount Transferred
		Atmospheric	Water	Soil	Subtotal	
Chloroform	127	0.8	0.0	0.0	0.8	14.5
Toluene	300	0.5	0.0	0.0	0.5	23.2
Dichloromethane	186	0.4	0.0	0.0	0.4	2.0
Acetonitrile	13	0.0	0.0	0.0	0.0	0.5
1,4-Dioxane	150	0.0	0.0	0.0	0.0	0.0
N,N-Dimethylacetamide	213	0.0	0.0	0.0	0.0	2.0
N,N-Dimethylformamide	232	0.0	0.0	0.0	0.0	5.7
2-Vinylpyridine	338	0.0	0.0	0.0	0.0	0.5
Methyl methacrylate	420	0.0	0.0	0.0	0.0	0.0
<b>Total</b>		<b>1.7</b>	<b>0.0</b>	<b>0.0</b>	<b>1.7</b>	<b>48.4</b>

Notes: All figures are the numerical sum for Tokuyama Corporation and Tokuyama Dental Corporation.

Substances are listed in descending order of emissions levels; substances with no emissions are listed in order of the regulatory number

Water refers to public waters

Amount transferred indicates the sum of the quantity transferred to sewage systems and the quantity subject to intermediate treatment

Total figures have been rounded to the first decimal place

## Sun·Tox Co., Ltd.

Established: February 14, 1992  
 Shareholder: Tokuyama Corporation (80%), Rengo Co., Ltd.(20%)  
 Head office: Akasaka Enoki-zaka Mori Building, 1-7-1 Akasaka, Minato-ku, Tokyo, Japan  
 Business activities: Manufacture and sale of biaxial-oriented polypropylene films and cast polypropylene films



Kazunori Shimada  
Plant Manager



Location: 3075-18 Shimasu, Itako-shi, Ibaraki, Japan  
 Number of employees: 197  
 Total site area: 89,800m<sup>2</sup>

### Kanto Plant

Sun·Tox's Kanto Plant manufactures biaxial-oriented polypropylene films and cast polypropylene films, which are used for food packaging and other applications, totaling about 29,000 metric tons annually. As a Type 1 Designated Energy Management Factory under the Japan's Act on the Rational Use of Energy, the Kanto Plant strives to cut down on its overall energy consumption on a per-unit basis.

Sun·Tox upgraded its gas cogeneration facilities with a higher-efficiency system. Moving forward, the company will further reduce energy consumption and environmental impacts. As it continues to implement three management systems, namely Japan's Occupational Safety and Health Management System (OSHMS), ISO 14001, and ISO 9001, the Kanto Plant is building on its achievements with the aim to be a community-based factory.

### Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Waste generated	Metric tons	26	15	20	15	23
Waste sent to landfills	Metric tons	7	4	10	5	10
Energy consumption	Thousand gigajoules	340	360	351	356	356
CO <sub>2</sub> emissions	Thousand metric tons	19	20	20	21	21
SOx emissions	Metric tons	0.3	0.2	0.3	0.3	0.1
NOx emissions	Metric tons	0.6	0.7	0.6	0.7	0.4
Soot emissions	Metric tons	0.03	0.06	0.05	0.04	0.02

### Tokuyama Plant

Sun·Tox's Tokuyama Plant manufactures environmentally friendly biaxial-oriented polypropylene films, which are mainly used for food and beverage packaging, amounting to about 23,000 metric tons annually. As part of its environmental initiatives, the plant is actively working to reduce per-unit energy consumption and increase recycling rates. With respect to safety, it acquired OSHMS certification in 2013 for all of its departments including R&D departments. Under the slogan, "Strictly following safety procedures, making manufacturing enjoyable, and never compromising quality," the plant aims to keep its facilities operating safely so it can be depended upon by the community, customers and employees.

### Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Waste generated	Metric tons	67	66	76	74	84
Waste sent to landfills	Metric tons	2	2	1	1	1
Energy consumption	Thousand gigajoules	445	463	458	471	463
CO <sub>2</sub> emissions	Thousand metric tons	26	27	27	27	28
PRTR-designated substance emissions	Metric tons	0.0	0.0	0.0	0.0	0.0
Complaints	Cases	0	0	0	0	0



Nobuhiko Nakayama  
Plant Manager



Location: 7-7, Harumi-cho, Shunan-shi, Yamaguchi, Japan  
 Number of employees: 147  
 Total site area: 24,100m<sup>2</sup>

## Sun Arrow Kasei Co., Ltd.

Established: February 1, 1999  
 Shareholder: Tokuyama Corporation (100%)  
 Head office: 1-2 Harumi-cho, Shunan-shi, Yamaguchi, Japan  
 Business activities: Manufacture and sale of polyvinyl chloride compounds



Yasuto Yasuzawa  
Plant Manager

### ■ Tokuyama Plant

Sun Arrow Kasei's Tokuyama Plant manufactures and sells polyvinyl chloride compounds used for pipes, joints, and other items essential for upgrading infrastructure, as well as resin window frames, which are highly effective for saving energy. The plant practices ISO 14001 environmental management, and ensures safety and prevents accidents by having all employees participate in activities designed to eliminate problems, identify near-miss situations, and practice the 5S principles. Owing to this approach, the plant has maintained an accident- and disaster-free record for 17 years since its establishment. In fiscal 2017, the plant intends to strictly enforce internal controls while carrying out Responsible Care activities based on a safety-first policy for all operations.



Location: 1-2 Harumi-cho, Shunan-shi, Yamaguchi, Japan  
 Number of employees: 27 / Total site area: 3,280m<sup>2</sup>

### Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Power consumption	Thousand kilowatt hours	2,455	2,562	2,473	2,659	2,490
Waste plastic produced	Metric tons	107	125	108	141	135
Waste plastic effectively used	Metric tons	107	124	105	141	135
Waste sent to landfills offsite for disposal	Metric tons	15	7	8	6	0
Steam usage	Metric tons	240	240	240	240	240
Industrial water consumption	Thousand metric tons	65	65	65	65	65

## Tokuyama Polypropylene Co., Ltd.

Established: April 2, 2001  
 Shareholder: Tokuyama (50%), Prime Polymer Co., Ltd. (50%)  
 Location: 1-1 Harumi-cho, Shunan-shi, Yamaguchi, Japan  
 Business activities: Manufacture and sale of polypropylene resin and flexible polypropylene resin



Yuichi Taguchi  
Plant Manager

### ■ Tokuyama Plant

Tokuyama Polypropylene's Tokuyama Plant conducts risk assessments of processes, facilities, and operations, and takes measures to identify near-miss situations and points of concern, in order to enhance the plant's safety culture. The result has been a perfect accident- and disaster-free record since the time it was first established as Tokuyama's polypropylene film business 41 years ago. The plant is scheduled to obtain recertification in 2017 under the High Pressure Gas Safety Act and the Ordinance on Safety of Boilers and Pressure Vessels, and is pursuing Responsible Care activities with the goals of extending its accident- and disaster-free record, reducing its environmental impact, and eliminating customer complaints related to quality.



Location: 1-1 Harumi-cho, Shunan-shi, Yamaguchi, Japan  
 Number of employees: 62 / Total site area: 70,997m<sup>2</sup>

### Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Industrial water consumption	Thousand metric tons	343	411	308	370	333
Waste generated	Metric tons	160	116	89	35	77
Waste sent to landfills	Metric tons	1.9*	15	2.4*	0	1.8*
Unit energy consumption index (fiscal 2002=100)	%	88	84	76	71	73

\* Year with periodic maintenance