

### Kao's approach

Kao is actively engaged in sound chemical management by using science-based risk assessment and risk management procedures in order to use and produce chemicals in ways that minimize their significant adverse effects on human health and the environment. By implementing appropriate chemical substances management across the entire product lifecycle from development and production through to use and disposal, we aim to contribute to the realization of a sustainable society.

## Kao's creating value to address social issues

### Social issues we are aware of

As a result of continued population growth and economic growth, inappropriate chemicals management poses significant risks to human health and to the environment. Humanity is faced with major problems that are global in scale, including environmental pollution, global warming, resource depletion, and loss of biodiversity.

Member countries at the World Summit on Sustainable Development (WSSD) held in 2002 adopted the international goals of "aiming to achieve, by 2020, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment, using transparent, science-based risk assessment procedures and risk management procedures, taking into account the precautionary approach." These objectives are known as the WSSD 2020 Goals. Toward this goal, the Strategic Approach to International Chemicals Management (SAICM) was formulated in 2006 and approved by the United Nations Environment Programme (UNEP).

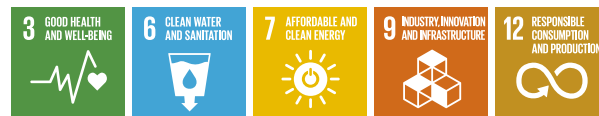
### Kao's creating value

In line with the global trend toward more rigorous chemicals management, we set medium-term objectives including "active implementation of sound chemical management in accordance with SAICM" in the Kao Environmental Statement released in 2009.

In 2012, we established the company-wide SAICM Promotion Committee, and we have been working to further enhance chemical substances management, including the strengthening of the foundations provided by our own Comprehensive Management System for Chemical Substances, which we developed ourselves to apply to our own operations.

Through our SAICM promotion activities, we are engaged in the sound chemicals management across the product lifecycle from development and production through to use and disposal. In this way, we are contributing to the realization of a sustainable society by helping to achieve the SAICM goal of minimizing the adverse risks that chemical substances pose to human health and to the environment.

### Contributions to the SDGs



## Policies

We handle a wide range of chemical substances in consumer products and industrial products, and have always engaged in thorough chemicals management. In addition, we are promoting and strengthening chemicals management based on the internationally established SAICM in order to use chemical substances more safely and soundly.

We formulated our SAICM Promotion Policy in 2013. It defines our company-wide management policy for chemical substances and forms the basis of our chemicals management.

### SAICM Promotion Policy

1. Development and Use of Safer and More Valuable Chemicals, and the Development of Manufacturing Processes with Less Environmental Impact
2. Chemicals Management throughout the Entire Life Cycle of Chemicals based on Scientific Risk Assessment
3. Compliance with Laws and Regulations on Chemicals and Voluntary Standards, and the Promotion of International Cooperation and Collaboration
4. Promotion of Risk Communications with Stakeholders



→ SAICM Promotion Policy  
[www.kao.com/global/en/sustainability/environment/statement-policy/statement/saicm-policy/](http://www.kao.com/global/en/sustainability/environment/statement-policy/statement/saicm-policy/)

### Framework

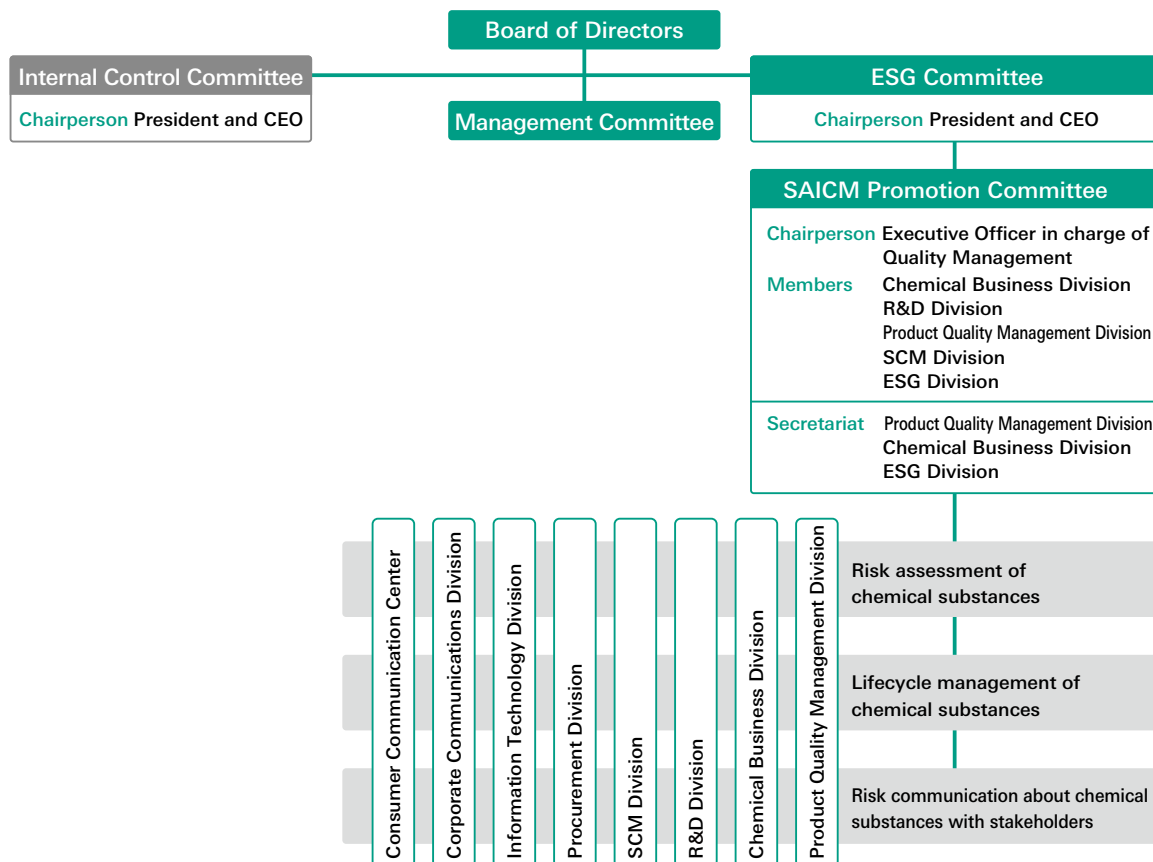
To accelerate implementation of initiatives aimed at realizing the SAICM objectives, we established the SAICM Promotion Committee in 2012 under the Sustainability Committee (now the ESG Committee) chaired by the President and CEO. Reporting to the President and CEO, and chaired by the Managing Executive Officer responsible for overseeing the Product Quality Management Division, the SAICM Promotion Committee is comprised of top-level management in the Product Quality Management Division, Chemical Business Division, R&D Division, Supply Chain Management (SCM) Division, Corporate Strategy Division and ESG Division. The three main types of SAICM promotion activities undertaken by Kao include:

1. Risk assessment of chemical substances.
2. Lifecycle management of chemical substances.
3. Risk communication about chemical substances with stakeholders.

We have established and are implementing projects for each of these activities under the committee. Besides project-specific meetings, the SAICM Promotion Committee meets 3–4 times a year to receive reports on the implementation status of individual projects, listen to lectures given by outside experts, and discuss measures relating to the realization of our vision for chemicals management in the post-2020 period. Over the period between 2012 and December 2018, the SAICM Promotion Committee met a total of 20 times.

In addition, under the Responsible Care (RC) promotion system, we are also promoting activities to reduce emissions of volatile organic compounds (VOCs) and other substances subject to the Japanese PRTR system.

SAICM Promotion Framework



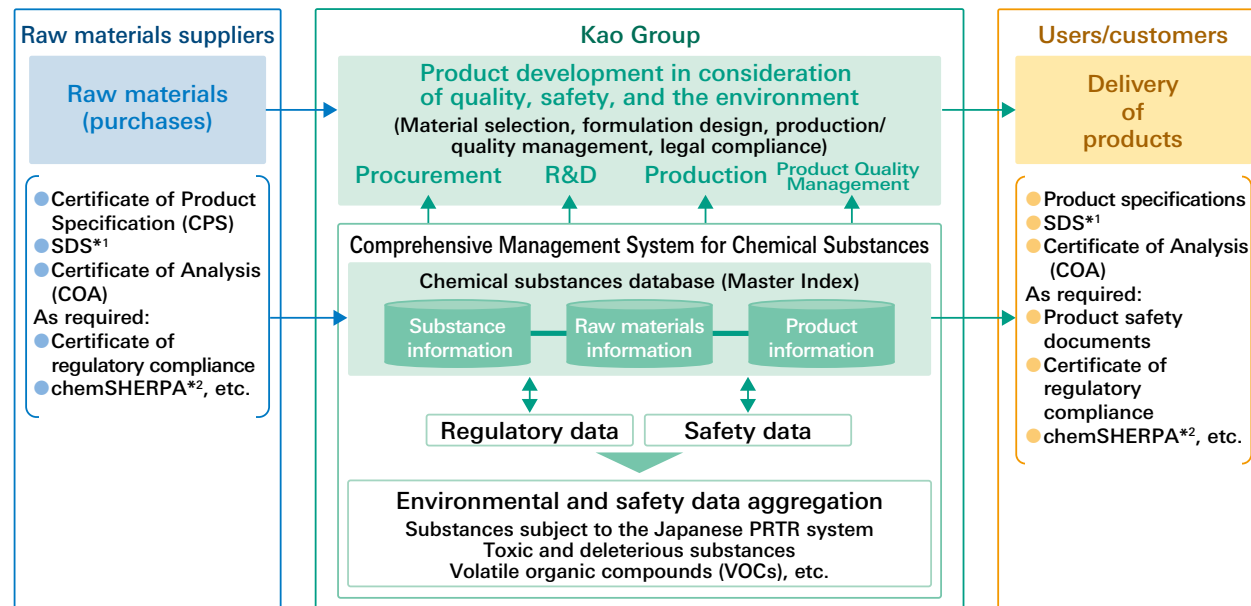
\* As of December 2018

## Comprehensive Management System for Chemical Substances

To ensure the safety and assurance of consumer and industrial products, in 2001 Kao has established the Comprehensive Management System for Chemical Substances, in which we assign consistent Kao Group codes (Master Index) to individual products and raw materials. The system provides a database which breaks down raw materials by their constituent ingredients. As a result, this system makes it possible immediately to verify the raw materials' quality, safety, anti-bacterial grade, regulatory and other information for each product. If a problem with a raw material arises, or if risk from a new substance of concern emerges, the extent of the effect can be immediately identified so that appropriate action can be taken. Based on integrated management by personnel with specialized expertise, data collected in the Comprehensive Management System for Chemical Substances are shared among Kao Group divisions. We are actively engaged in sound chemical management on a company-wide basis.

In 2017, we expanded the functionalities of the existing system. Following this, in 2018 we promoted the widespread adoption of the system by Kao affiliates all over the world. We will continue to further strengthen the functionality of the Comprehensive Management System for Chemical Substances, in response to increasingly stringent regulatory requirements, the growing diversity in chemical substances handled, and our business expansion into new countries and new business areas.

### Kao Comprehensive Management System for Chemical Substances



\*1 SDS

Safety Data Sheet. Document providing information to ensure safe and appropriate handling of chemicals, such as names of substances contained in the product, information about potential hazards and handling precautions.

\*2 chemSHERPA

A new scheme that facilitates sharing information on chemical substances in products across the entire supply chain to address broadening regulations and appropriately manage chemical substances contained in products on an ongoing basis.

➔ chemSHERPA website: <https://chemsherpa.net/english>

### Education and promotion

We utilize a range of communication tools to share safety information for chemical products so as to ensure safety related to chemical substances for customers, consumers and operators, and to ensure that chemicals are used appropriately and any necessary actions are taken, thereby promoting a further enhancement of accident prevention and environmental protection.

#### Public disclosure of SAICM promotion activities results

We publish the details of our SAICM promotion activities, as well as safety summaries of Kao priority assessment substances for which we have conducted a risk assessment and GPS safety summaries of Kao chemical products. We then disclose this information on the Kao and Kao Chemicals websites, striving to communicate information about chemical substance related risks both inside and outside Kao.



→ p. 63 Our initiatives: Risk communication about chemical substances with stakeholders - 1. Public disclosure of SAICM promotion activities results

#### Education about the risks and hazards of chemical substances

The SCM Division has developed educational programs for current and new employees and internal transfers, which are structured by field of specialization and level of experience. The curriculum includes information on the risks and hazards of chemical substances.

#### Education about chemical substances management

We also provide education relating to chemical substances management for researchers involved in the development of consumer products, chemical products and base materials, and for employees at Kao and partner companies involved in production activities. In addition, we hold in-house lectures and seminars on chemicals management on an annual basis. In 2018, 296 people participated in these sessions.



In-house seminar on chemicals management by an invited outside expert

### Collaboration with stakeholders

We aim to collaborate with stakeholders so as to minimize the risks from chemicals which affect on human health and the environment if chemicals are managed inappropriately.

To deepen understanding of social trends and of stakeholders' expectations of companies concerning chemicals management, and to obtain feedback on our SAICM promotion activities, we regularly invite outside experts to give presentations and exchange views. We also strive to realize proactive cooperation with industry organizations, including the Japan Chemical Industry Association (JCIA) and the Japan Soap and Detergent Association (JSDA), so as to contribute toward chemicals management activities in related industries.

In addition, so as to promote appropriate management through chemicals regulation, we exchange views with government authorities within and outside Japan (including Japanese government ministries and the governments of ASEAN member states) and host trainees in collaboration with government agencies.

Furthermore, we collaborate with retailers on the promotion of safety management with respect to product use by customers, and we use tools such as chemSHERPA to promote appropriate management of chemicals in products throughout the supply chain.



→ p. 63 Our initiatives: Risk communication about chemical substances with stakeholders

## Mid- to long-term targets and performance

### 2020 mid-term targets

We are promoting chemical substances management in line with the following mid- to long-term targets, with the aim of realizing a sustainable society.

#### **1. Risk assessment of chemical substances**

We select Kao priority assessment substances taking into consideration factors such as the production and usage volume, the exposure level for people and the environment, and priorities in our corporate activities. We then conduct assessment in accordance with our risk assessment policy, and implement appropriate management on the basis of this assessment.



→ Risk assessment policy  
[chemical.kao.com/global/sustainability/saicm/article\\_03.html](https://chemical.kao.com/global/sustainability/saicm/article_03.html)

Risk assessment of chemical substances is conducted with the following objectives.

- Conduct risk assessments for the Kao priority assessment substances (19 categories) by 2020 and continue this activity after 2020.



→ Kao's Safety Summary of chemicals for priority risk assessment  
[chemical.kao.com/global/sustainability/saicm/article\\_05.html](https://chemical.kao.com/global/sustainability/saicm/article_05.html)

#### **Examples of the 19 categories**

- Alkyl glycosides (a class of non-ionic surfactants): Widely used in everyday household products such as kitchen detergents, household detergents, body soaps, shampoos, etc.
- Polyoxyalkylene alkyl ethers (a class of non-ionic surfactants): Widely used in everyday household products such as laundry detergents, kitchen detergents, household detergents, shampoos, bleach, etc.
- Sodium linear-Alkylbenzene sulfonate (a class of anionic surfactants): Widely used in everyday household products such as laundry detergents, kitchen detergents, etc.
- Polyester resin for use in toner (polyester resin used as a binder in toner)

#### **2. Lifecycle management of chemical substances**

We have set the following targets at workplaces where chemical substances are handled to prevent adverse health impacts on workers.

- Conduct risk assessments and implement corresponding measures at workplaces where chemical substances are handled by 2020, and continue to conduct risk assessments for new chemical substances and implement corresponding measures after 2020.

#### **3. Risk communication about chemical substances with stakeholders**

We have set the following targets for communicating safety information throughout the supply chain for chemical products that we manufacture and sell, and for ensuring safety, sound use and the ability to take necessary action pertaining to chemical substances.

- Release the safety summaries for 20 Kao priority risk assessment substances by 2020 and continue this activity after 2020.
- Release GPS Safety Summaries\* for 150 chemical products by 2020 and continue this activity after 2020.

\* GPS Safety Summary

A document providing a summary of chemical substance safety information as a reference for the general public. Besides information about physical and chemical properties, this document also addresses the usage and processing requirements for sound risk management and outlines risk management measures. It is also used to disseminate information to downstream users.

## Performance in 2018

The SAICM Promotion Committee set the following project targets for 2018 and conducted activities accordingly.

### Performance

#### 1. Risk assessment of chemical substances

1. Conduct risk assessments and compile risk assessment reports for Kao priority assessment substances (three substances).
2. Discuss the risk assessment results with outside experts and with the Japanese Society of Toxicology (JSOT).
3. Publish the paper on risk assessment techniques and methods (an article on the topic of "Improving the Estimation Accuracy of the Environmental Exposure Model" has already been accepted in the Journal of Japan Society on Water Environment).
4. Improve the exposure assessment techniques (exposure assessment for products placed on the Asia markets and for professional-use products).
5. Continue the global roll-out of the Comprehensive Management System for Chemical Substances.

#### 2. Lifecycle management of chemical substances

1. Continue to conduct risk assessment in accordance with the Industrial Safety and Health Law, as well as development relevant methods and to apply them for risk assessment in manufacturing process (workplaces in Japan).
2. Implement GHS\* hazard labeling at workplaces for all production facilities in Japan, and extend the implementation areas into production facilities outside Japan.

\* GHS

Globally Harmonized System of Classification and Labelling of Chemicals.

#### 3. Risk communication about chemical substances with stakeholders

1. Public disclosure of SAICM promotion activities results. We have released a cumulative total of 16 safety summaries for Kao priority assessment substances, and a cumulative total of 141 GPS Safety Summaries for Kao chemical products, more than any other enterprise in Japan (in recognition of this achievement, we received the JIPS Award from the Japan Chemical Industry Association).
2. Continue to review our mutual communication with stakeholders.

### Reviews of performance

In our initiatives relating to chemical substances, we achieved our objectives in all projects. New issues that were identified through the initiatives were shared with the SAICM Promotion Committee, and responses to these issues were incorporated into activity planning for 2019.

In addition, we began discussing our activities and contributions through Kao's chemicals management beyond 2020.



→ p. 62 Our initiatives: Risk assessment of chemical substances/Lifecycle management of chemical substances/Risk communication about chemical substances with stakeholders

## Our initiatives

### Risk assessment of chemical substances

#### 1. Conduct risk assessments and create risk assessment reports for Kao priority assessment substances in line with the mid-term plan

In 2018, we completed risk assessments for Kao priority assessment substances in three categories scheduled for 2018 (for a cumulative total of 18 categories) according to the mid-term plan, and compiled the results in risk assessment reports. Risk for human and the environment was acceptable level for all three categories. We also revised list of priority assessment substances from FY 2019, taking into account social and environmental changes.

#### 2. Implement the global roll-out of the Comprehensive Management System for Chemical Substances

Based on Kao's Comprehensive Management System for Chemical Substances, we are continuing to strengthen the functionality of the Comprehensive Management System for Chemical Substances with a focus on rebuilding the existing regulatory management system and the Safety Data Sheets (SDS) preparation and management system. We have already begun working on concrete system design, with the aim of building foundations for chemicals management in response to changes in the globally accelerating society and environment.

### Lifecycle management of chemical substances

#### 1. Plan and implement risk reduction measures based on risk assessments at workplaces where chemical substances are handled

We conduct risk assessments at workplaces where chemical substances are handled on the basis of the results obtained with the qualitative risk assessment method (the conventional control banding method<sup>\*1</sup>), utilizing the quantitative method with the ECETOC TRA<sup>\*2</sup> tool which has been identified by the EUs REACH<sup>\*3</sup> regulation as a preferred approach for risk assessment. In 2018, we continued to conduct risk assessment, while also integrating the CREATE-SIMPLE<sup>\*4</sup> tool introduced by Japan's Ministry of Health, Labour and Welfare. In order to realize efficient implementation of the risk assessment outlined above, we have developed part of system of the assessment process. This System adoption has already begun at factories in Japan and at other relevant units (for example; Production Technology). The implementation areas are gradually going to extend into production facilities outside Japan in 2019.

The amended Industrial Safety and Health Act in Japan went into force in June 2016. In accordance with the requirements of this law, we are continuing to conduct risk assessments and adopt risk mitigation measures for working procedures which have been newly adopted or changed.

In 2018, we continued to introduce risk assessment into the step of manufacturing process review to ensure that risk assessments of new working procedures are conducted. With regard to cosmetic products, where the number of individual product items is particularly large, we have defined the highest risk rank in each manufacturing area and have implemented risk mitigation countermeasures for each area.

<sup>\*1</sup> Control banding method

A method of assessing the risks of health hazards associated with chemical substances. This is a method for managing chemical substances designed by the International Labour Organization (ILO) that incorporates simple and practical risk assessment methods. It is intended to protect the health of workers in small- and medium-sized companies in developing countries from hazardous chemicals. For each process that requires handling of hazardous chemicals, risks are ranked into four levels according to three component elements: the hazardousness of the chemical, its form (volatility/risk of becoming airborne), and the amount being handled. In addition to indicating general management items to be implemented in each category, this tool also makes it possible to indicate more specific items to be implemented with regard to other general work tasks.

<sup>\*2</sup> ECETOC TRA (European Centre for Ecotoxicology and Toxicology of Chemicals Targeted Risk Assessment)

A risk assessment tool used in REACH, the EU system for registering chemical substances. Able to obtain the risk determination as well as risk management direction.

<sup>\*3</sup> REACH

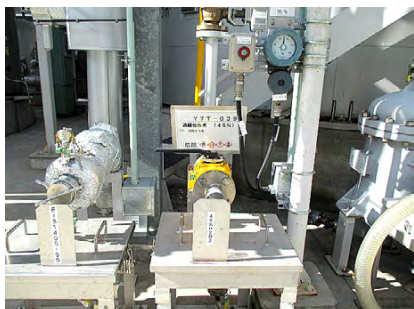
Registration, Evaluation, Authorization and Restriction of Chemicals (EU system).

<sup>\*4</sup> CREATE-SIMPLE (Chemical Risk Easy Assessment Tool, Edited for Service Industry and MultiPLE workplaces)

A simple chemical substance risk assessment tool designed for use in a wide range of workplaces, including service sector workplaces. It was announced by Japan's Ministry of Health, Labour and Welfare in 2018.

### 2. GHS hazardous labeling at workplaces where chemical substances are handled

To ensure that workers can check the hazards for chemical substances before handling them, since 2016 we have displayed GHS hazard labels at sampling, filling and other workplace areas inside plants that handle chemical substances. As of 2018, labeling had been completed at all nine plants in Japan, while of the group's 21 plants outside Japan, labeling has been rolled out at six chemical plants in the Asia region.



GHS hazard labeling in the workplace (example).

### Risk communication about chemical substances with stakeholders

#### 1. Public disclosure of SAICM promotion activities results

We prepare risk assessment reports and compile their safety summaries for publicly disclosure. By providing information on chemicals and management measures, we continue to promote risk-based chemicals management.

In 2018, we released safety summaries for an additional three Kao priority assessment substances (for a cumulative total of 16 summaries), the selection of which took into account factors such as the quantity manufactured, the applications, the quantity used, the exposure amount for people and the environment, and priorities in our corporate activities. Moreover, we released 16 GPS Safety Summaries for Kao chemical products (for a cumulative total of 141 summaries). We continued to set a new record for the largest number of GPS Safety Summaries released by a Japanese business enterprise.

#### Released in 2018

Polyoxyalkylene alkyl ether sulfate, alkyl glyceryl ether, polyester resin for use in toner.



→ Kao's Safety Summary of chemicals for priority risk assessment  
[chemical.kao.com/global/sustainability/saicm/article\\_05.html](http://chemical.kao.com/global/sustainability/saicm/article_05.html)

→ GPS Safety Summary  
[chemical.kao.com/global/products/gps/](http://chemical.kao.com/global/products/gps/)

In 2018, we received the JIPS Award from the Chemicals Management Committee of the Japan Chemical Industry Association in recognition of having disclosed the most GPS Safety Summaries of any company in 2017 and demonstrated excellence in JIPS initiatives.



→ p. 67 Our initiatives: Providing information on chemical products for sound chemical management / Topic: Kao Corporation's Chemical Business unit receives the JIPS Award

#### 2. Stakeholder communication

We promote communication with stakeholders so as to minimize the risks that inappropriate chemicals management poses to human health and to the environment.

#### Collaboration and communication with consumers

We have discussed risk awareness of chemicals making use of communication tools in the program of the Kao Eco-Lab Museum, our experiential museum. The tools have been created for our stakeholders to deepen understanding of benefit and risks from chemicals.

Regarding risk communication with local residents in the vicinity of our plants and local government authorities, we have exchanged ideas and experiences with other companies. The aim was to share the communication issues and opportunities for further reliability in the society.



### Lectures by outside experts and discussion meetings

To deepen understanding about social trends and what stakeholders expect from companies concerning chemicals management, and to obtain feedback on our SAICM promotion activities, we regularly invite outside experts to hold in-house seminars and exchange opinions in meetings of the SAICM Promotion Committee.

In 2018, we invited experts on risk communication and safety to give lectures and engage in the exchanging of opinions.

### Collaboration with industry organizations

We have engaged in a wide range of activities so as to contribute to chemicals management in related industries.

As part of our efforts to ensure that the chemical industry as a whole makes a positive contribution to SAICM, we are actively involved in JIPS\*, a voluntary initiative intended to strengthen chemicals management.

We also participate actively, in collaboration with various industry organizations, on initiatives relating to consumer products. For example, we have joined forces with the Japan Soap and Detergent Association (JSDA), taking on the role of working group leader in relation to the development of new safety icons (ten types) for consumer products. In 2018, we were engaged in an initiative to realize the globalization of these safety icons and their adoption as an international standard.

\* JIPS

Japan Initiative of Product Stewardship. A voluntary initiative based on Global Product Strategy (GPS) principles for enhancing global chemicals management promoted by the International Council of Chemical Associations (ICCA) in response to the adoption of SAICM.



→ Newly developed safety icons  
p. 105 Community > Universal Design > Promoting the adoption of new safety icons for consumer products



→ JSDA gave an address on safety icons at the 11th Asia Oceania Soap & Detergent Association Conference (AOSDAC 2017) in Taiwan.  
[jsda.org/w/01\\_katud/w\\_2017-AOSDAC.html](http://jsda.org/w/01_katud/w_2017-AOSDAC.html) (Japanese)

### Collaboration with government agencies

In order to promote appropriate chemicals management through chemical substance regulation, we have made effective use of opportunities for communication and exchange with government agencies in Japan involved with chemical substance management, familiarizing them with Kao's SAICM promotion activities, and discussing our framework for chemical substance management in the period from 2020 onwards.

We also cooperate with initiatives led by the Japanese government in relation to chemical substance management that involve other countries in Asia, and actively participate in exchanges of views with government authorities inside and outside Japan, while also hosting overseas trainees and receiving visits from private-sector companies.

In addition, in response to the growing trend toward stronger regulation in the ASEAN region, we have contributed to the rationalization of regulatory controls through the effective utilization of regulatory science findings at meetings relating to the establishment of new regulations.

### Collaboration with distributors

In our chemical business division, we have built a strong system for collaboration with distributors. We implement a wide range of activities in areas that include responding to chemical substance related regulations (both within and outside Japan), import/export management (including provisions for GHS, etc.), and Management of chemicals in products that requires a response throughout the supply chain. We are also working to strengthen information sharing in relation to business continuity planning (BCP) response and other fields, so as to be prepared for emergencies such as large-scale natural disasters.

In 2018, we promptly shared much information with distributors to realize revised laws and regulations concerning import/export and chemical substances through the special site named "Extranet" which is for linking each distributor with us. In March and September 2018, we provided distributors and customers with the latest versions of chemSHERPA-CI for our products, and we also asked suppliers to provide chemSHERPA-CI for the raw materials used in their products. In this way, we have been promoting appropriate Management of chemicals in products throughout the supply chain.

Through various activities, we will continue to build understanding regarding chemical substances and raise awareness of the importance of risk management.

## Approach to issues of chemical substances related to legal compliance, safety and the environment

### Global compliance with chemical regulations

The Kao Group registers chemical substances contained in Kao products manufactured outside Japan and in other Kao products directly and indirectly exported outside Japan according to the quantities and hazard levels, based on the chemical regulations of the relevant countries, and in accordance with Kao's basic strategy for SAICM promotion.

#### Europe

In the EU, REACH (European regulations on chemical substances) requires registration of all chemical substances manufactured or imported in quantities of one ton or more per year per manufacturer or importer. Registration is also required for each monomer contained in polymers, even if the registrant does not manufacture or import the monomer itself. Working in close cooperation with Kao Chemicals Europe (KCE) and other Kao Group member companies, we have identified substances required for registration each year, and have been registering in accordance with REACH requirements.

We have completed registration of all substances scheduled to be registered without delay by the final deadline, at the end of May 2018. Following registration, we continue to fulfil our corporate responsibility as a lead registrant or as one of the co-registrants for detailed assessment conducted by the European Chemicals Agency (ECHA).

#### Americas

In the United States, the TSCA\*<sup>1</sup> was amended in June 2016. There were no major changes in the notification process for new chemical substances. Nevertheless, we have been taking actions in response to the more rigorous assessment of new chemical substances by the law and submitting the required documents.

TSCA inventory has been reviewed under the amendments of the TSCA. Kao Specialties Americas LLC has completed the submission of data regarding chemical substances manufactured in or imported into the U.S. within the specified period.

#### Asia (China, South Korea, Taiwan, Thailand, Vietnam)

China and other countries and regions in Asia are also moving quickly to make registration mandatory for products corresponding to new chemical substances and hazardous chemical products. We are working together with local Kao companies to submit the relevant notifications before manufacture or import of these products.

#### China

Since 2010, The Measures for Environmental Administration of New Chemical Substances in China have required registration of newly manufactured and imported chemical substances. In addition, following the explosion that occurred at a warehouse in the Binhai New Area in Tianjin in 2015, registration requirements for products that contain hazardous chemicals have become more stringent. In cooperation with local Kao companies in China including Kao (China) Holding, we have completed document submission and registration before manufacture or import of relevant substances. In cooperation with local

subsidiaries, the renewal registration for hazardous chemicals that will expire by 2018 has been completed. In 2019, we will monitor enactment of related new legislation and amendments of the current law and share this information with the relevant divisions to comply with legal requirements without delay.

#### South Korea

In South Korea, after the Act on the Registration and Evaluation of Chemicals (K-REACH)\*<sup>2</sup> came into force in 2015, we took actions to comply with the legal requirements, including registering and reporting quantities for new and existing chemical substances. Through our South Korean agent, we have been participating in two consortiums on existing chemical substances subject to registration, and we successfully completed registration within the registration deadline of June 2018. With the partial revision of K-REACH in January 2019, manufacturers/ importers that manufactured or imported at least one ton per year of an existing substance between 2016 and 2018, shall submit application for pre-registration between 1 Jan. 2019 and 30 Jun. 2019, and we have been working to identify relevant substances.

\*1 TSCA

Toxic Substance Control Act of the United States.

\*2 The Act on the Registration and Evaluation of Chemicals (K-REACH)  
The Act on the Registration and Evaluation of Chemicals of South Korea.

## **Taiwan**

In Taiwan, we have calculated the total quantities every two months and submitted reports for chemical substances manufactured or imported in excess of 100 kg per year in cooperation with Kao Taiwan, in accordance with the requirements of the Toxic Chemical Substance Control Act. Regarding the Phase Two registration for existing chemical substances that was originally scheduled to be implemented in January 2019, implementation by the government has been delayed, and we are continuing to monitor developments, including the passage of new legislation. In addition, as it is anticipated that a new annual quantity reporting requirement will be introduced, we are working to share information on the targeted substances through collaboration with Kao Taiwan.

## **Thailand**

In Thailand, the government announced the preparation of an existing chemical substances inventory and registration system for new chemical substances in August 2015. The registration system for new chemical substances does not yet have a timeline. For existing chemical substances inventory, we continue to submit notifications in cooperation with Kao Industrial (Thailand). We have created a list of the required products and completed preliminary notifications more or less on schedule, mainly for products that we have a record of handling. We will continue to monitor announcements on the registration system for new chemical substances and existing chemical substances inventory, and we plan to prepare notifications and take the appropriate steps for existing products and chemical substances as our secondary response.

## **Vietnam**

Vietnam is preparing an existing chemical substances inventory based on its Law on Chemicals. Working in collaboration with Kao Vietnam, we completed the

submission of required documents by October 15, 2018, the deadline for Stage One re-registration.

## **Other countries**

We are taking the requisite steps to comply with laws on the manufacture, import and use of chemical substances in Indonesia, Malaysia, the Philippines and Singapore.

## **Providing information on chemical products for sound chemical management**

We communicate safety information for chemical products to ensure safety related to chemical substances throughout the supply chain and to ensure that the chemical substances are used appropriately and that any necessary actions are taken.

### **1. GHS-compliant SDS and product labeling**

We issue GHS-compliant SDS for chemical products in countries that have introduced GHS, as well as promoting GHS-compliant product labeling.

For the Chemical Business, including Kao Japan and Asian affiliates, we have created GHS-compliant SDS and product labels as well as conducting integrated management using the Comprehensive Management System for Chemical Substances since 2008.

In 2018, we continued to use GHS labeling for products marketed in countries and regions that have introduced GHS (Japan, the EU, the U.S., Taiwan, South Korea, China, Singapore, Thailand, Indonesia, Vietnam and Malaysia) from our plants in Japan and Asia. We have also been monitoring regulatory trends in countries that have adopted GHS, and we have updated SDS and labels as necessary.

In Japan, with a revision of the Japan Industrial Standards (JIS) scheduled for 2019, we are preparing to update both SDS and product labels.

In countries that have introduced GHS outside Japan, in order to facilitate global transactions, we are monitoring regulatory trends and promoting the creation and issuance of GHS-compliant SDS and product labeling as we do in Japan.

At the same time, recognizing the need in countries throughout the world for the rapid creation and effective management of high-quality GHS-compliant SDS and product labels, we are working to develop an even more advanced Comprehensive Management System for Chemical Substances.

### **2. Providing and obtaining information on chemicals in products**

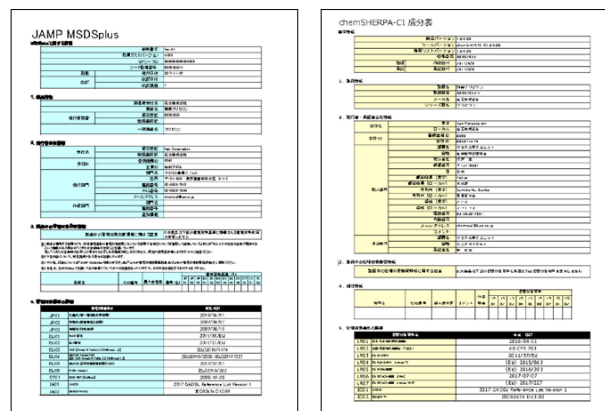
To comply with increasingly stringent regulations in various countries as well as with industry standards, we proactively manage the chemical substances contained in chemical products (management of products containing chemical substances). We are a founding member of JAMP\*<sup>1</sup> and efficiently manage and communicate information on products containing chemical substances on an ongoing basis using the standardized forms provided by JAMP.

With regard to chemSHERPA, a new information communication scheme for products containing chemical substances, developed at the initiative of the Japanese Ministry of Economy, Trade and Industry and entrusted to JAMP for its operation, we led the industry in switching over from MSDSplus to the revised version of chemSHERPA-CI\*<sup>2</sup> (Substance List Ver. 1.04.00) in September 2017. chemSHERPA-CI currently has websites in multiple languages (including Japanese, English and Chinese).

In 2018, in regard to our products in Japan and the products of Kao affiliates in Asia, a revised version of chemSHERPA-CI was issued from March 2018 (Ver. 1.05.00), as well as a revised version of chemSHERPA-CI

(Ver. 1.06.00) from September 2018. We distributed the new versions to customers via our distributors and disclosed them in Japanese, English and Chinese language versions on our website. We have also been receiving chemSHERPA-CI data from suppliers regarding the raw materials used in chemical products, and have been implementing management of the substances contained in chemical products based on the reported information.

In the future, we will continue to cooperate with the relevant internal and external divisions and groups and actively engage in initiatives to promote improvements and to strengthen management of products containing chemical substances in the supply chain.




Examples of MSDSplus output (left) and chemSHERPA-CI output (right) for a Kao chemical product.

### 3. Disclosure of risk information on chemical substances (GPS Safety Summaries)

We are an active participant in the Japan Initiative of Product Stewardship (JIPS), a voluntary initiative aimed at strengthening chemicals management through product stewardship advocated by the International Council of Chemical Associations (ICCA). The Japan Chemical Industry Association has been implementing

the initiative, which constitutes an effort by the chemical industry to make a major contribution toward SAICM, since 2009. To this end, we are actively engaging in communication related to chemical substances with customers. We have always been proactive in providing SDS, chemSHERPA, and eSDS\*3 for European disclosure of chemical products, as part of communication efforts of chemical substance. In recent years, we have proactively made GPS Safety Summaries available on the Kao Chemicals website and ICCA's GPS Chemicals Portal to outline, in an easy-to-understand manner, hazard information and information on product risks. We consider publication of GPS Safety Summaries as an important element of risk communication on chemical substances with stakeholders, which constitutes part of our SAICM promotion activities.

 → GPS Safety Summaries

- Kao Chemicals website  
[chemical.kao.com/global/products/gps/](http://chemical.kao.com/global/products/gps/)
- ICCA's GPS Chemicals Portal  
[icca.cefic.org/Home/](http://icca.cefic.org/Home/)

In 2018, we once again published safety summaries for Kao priority assessment substances on the Kao Chemicals website, as the deliverables of risk assessment. We prepared 18 GPS Safety Summaries in Japanese and English for chemical products related to these substances and released them on the Kao Chemicals website and on the ICCA's GPS Chemicals Portal. We also prepared and published 16 GPS Safety Summaries for products with REACH registration. As a result, the Kao Group has published a total of 141 GPS Safety Summaries globally. Both last year and this year,

we published more GPS Safety Summaries than any other company in Japan.

In 2019, we will continue to publish GPS Safety Summaries to encourage customers and the wider society to make effective use of GPS Safety Summaries, and to engage in risk communication on a global basis.

- \*1 JAMP  
Joint Article Management Promotion-consortium.
- \*2 chemSHERPA-CI  
A chemical product data form sheet for communicating information on specified chemical substances corresponding to MSDSplus.
- \*3 eSDS  
An extended Safety Data Sheet (SDS). Adds risk appraisal and risk management content to the conventional SDS.

### Topic Kao Corporation's Chemical Business unit receives the JIPS Award

In February 2018, Kao Corporation's Chemical Business unit received the JIPS Award. This marked the second consecutive year that Kao had received this award.

The JIPS Award was established by the Chemicals Management Committee of the Japan Chemical Industry Association (JCIA) in 2017 to recognize companies that have demonstrated excellence in voluntary GPS/JIPS activities for chemicals management throughout the supply chain.

We received this award in recognition of having released a large number of GPS Safety Summaries, and of our proactive pursuit of chemical substance management.



Awards ceremony

## Strengthening export and import management of chemical products

As the Chemical Business continues to globalize at an increasingly fast pace, the need to introduce a system for import and export management has risen sharply. This includes the need to automatically check legal regulations during importing and exporting at Kao companies related to the Chemical Business, and requests from inside and outside Kao to strengthen our system of checks in order to comply with legal regulations.

We adopted a new import/export management system at 11 companies related to the Chemical Business in 2017, and we are continuing to implement appropriate system operation.

In line with the termination of the phased REACH registration in 2018, we have adjusted our check items and completed the process of reflecting them into the system. We will continue to take appropriate measures in accordance with changes in laws and regulations.

## Activities relating to legal compliance in Japan

### 1. Compliance with the Chemical Substances Control Law

The Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. (Chemical Substances Control Law) mandates reporting on product quantities by usage application. We continued to survey detailed usage information on chemical products in 2018 with the cooperation of sales distributors, and we are maintaining the most up-to-date information and reporting product quantities.

In relation to the Priority Assessment Chemical Substances that were added under the law in 2018, we revised the SDS for the target chemical products and provided the relevant information to customers and sales distributors.

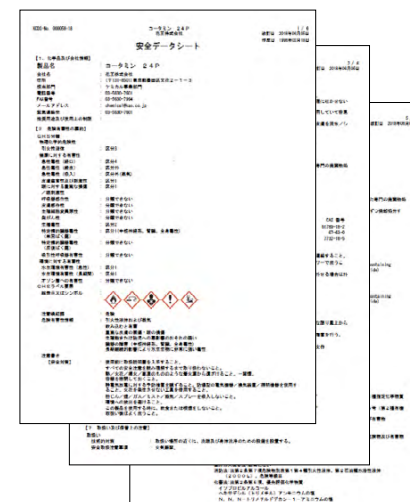
The changes in the submission forms and documents required for reporting small quantities of new substances are coming into effect in 2019 in accordance with the 2017 amendments to the Chemical Substances Control Law. In line with these changes, we are sharing information within the group companies and putting in place the systems needed to enable prompt, accurate reporting pursuant to the Chemical Substances Control Law.

In 2019, we will continue to survey and update usage information on chemical products with the cooperation of sales distributors and to provide information on the Priority Assessment Chemical Substances for the target chemical products according to the obligation of the Law.

### 2. Compliance with the Industrial Safety and Health Act

For the substances with mandated labeling and notification added under the Industrial Safety and Health Act, which was amended in 2018, we have revised the SDS for the target chemical products and provided the SDS to the relevant customers and sales distributors. In 2019, we will continue to take steps to comply with the addition of new substances to the scope covered by the Industrial Safety and Health Act.

We will also continue our efforts to ensure worker safety by properly implementing hazard assessment and new substance reporting with respect to new chemical substances falling within the scope of the Industrial Safety and Health Act that are handled by companies within the group companies and by contract manufacturers.



Revised SDS for a new priority assessment chemical substance added pursuant to the Chemical Substances Control Law (example)

### Emission Management of Chemicals

#### Monitoring and controlling emissions of chemical substances subject to the Japanese PRTR system

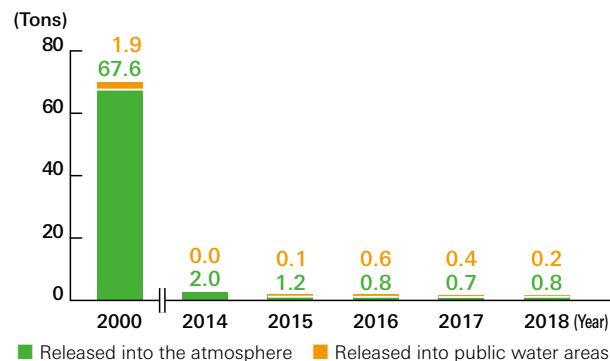
We began activities in this area by setting a voluntary target for annual emissions of one ton or less for each substance from each plant in FY 2000. We achieved this target in FY 2002. Since then, we have continued to achieve this voluntary target, excluding leaks of chlorofluorocarbon and similar emissions.

The number of chemical substances subject to the Japanese PRTR system of which we handled over one ton in 2018 was 75, and the total discharge of such substances into the atmosphere and public water areas was 1.0 ton. In addition, we are voluntarily monitoring and controlling releases and transfers (in the same way as would be done for chemical substances subject to PRTR) of chemical substances that the Japan Chemical Industry Association has specified as being subject to voluntary surveys.



→ List of Emissions of Substances Subject to PRTR System  
[www.kao.com/global/en/sustainability/environment/activity-data/chemical-management.html](http://www.kao.com/global/en/sustainability/environment/activity-data/chemical-management.html)

Total emissions of chemical substances subject to the PRTR system



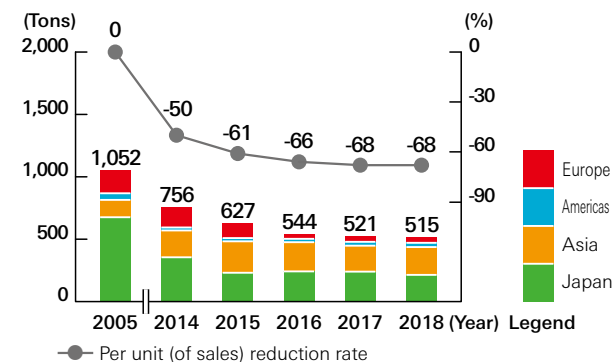
#### Management of volatile organic compound (VOC) emissions

Although we have no facilities subject to the VOC emission regulations provided in the Air Pollution Control Act, we work to voluntarily cut VOC emissions.

For the 100 VOC substances defined in the notice issued by the Director General of the Environmental Management Bureau, Ministry of the Environment, we set voluntary targets on the annual atmospheric emissions from each plant for each substance (5 tons or less in 2005, 3 tons or less in 2009, 1 ton or less in 2010), conducted emission reduction activities and accomplished our targets. We are managing VOC emissions with the current target of maintaining our activities.

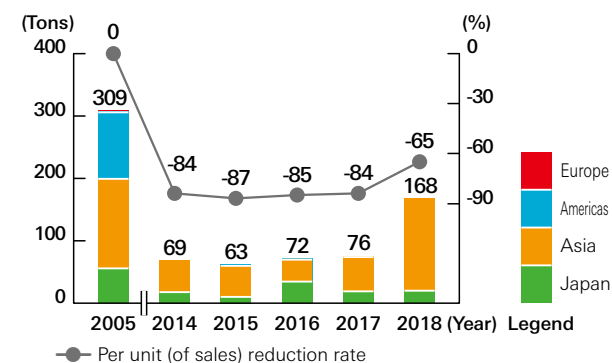
The group in Japan handled 35 types of VOCs in quantities over 1 ton in 2018, with total emissions into the atmosphere of 10 tons .

NOx emissions



\* Boundary: All Kao Group production sites.  
 \* Assurance provided for NOx emission figures.  
 \* Per unit of sales is calculated based on Japanese standards up to fiscal 2015, and on International Financial Reporting Standards (IFRS) from fiscal 2016.

SOx emissions



\* Boundary: All Kao Group production sites.  
 \* Per unit of sales is calculated based on Japanese standards up to fiscal 2015, and on International Financial Reporting Standards (IFRS) from fiscal 2016.

## Examples of Kao products that contribute to reducing the environmental impact

In this section, we introduce some Kao eco-chemical products that help to reduce the environmental impact and contribute to the sustainability of the world.

### Green Innovation and Eco Technological Solutions

By emphasizing the two axes of Green Innovation and Eco Technological Solutions in chemical product development, we are implementing measures to reduce environmental impact through revolutionary new technologies.

#### Green Innovation

Green Innovation involves creating materials that are competitive yet have a low environmental impact. More specifically, we draw on our strengths and carry out global investment to increase our offerings of natural fats and oils derivatives with high added value. In addition, we will further cultivate the upstream and downstream domains for these derivatives.

For example, we are making use of non-edible raw materials in an effort to resolve the significant social issue of food shortages. We are also focusing on downstream raw material development, one of our areas of expertise, which uses biomass materials in place of fossil materials.

#### Eco Technological Solutions

We ascertain customer needs and issues from the perspective of reducing environmental impact, and provide solutions that boost customer value through groundbreaking product development.

### Product examples

#### Lunajet water-based inkjet ink

During further applications of the pigment nano-dispersion technology that we had developed thus far, we successfully developed the world's first water-based inkjet ink for use in printing on soft packaging film substrate that features a VOC-free design\* with a low environmental impact. It is now possible for us to provide soft packaging film-printed material that combines high quality with a low environmental impact. We also confirmed that this water-based inkjet ink technology can be applied to water-based gravure-printing ink.

In 2018, we showcased a printer using *Lunajet* at the International Graphic Arts Show 2018 (IGAS 2018), a major conversion technology show and comprehensive international printing technology and solutions exhibition, aiming to further expand the range of applications of this new technology. In recognition of the new technology that realizes a level of image durability comparable to that of ultraviolet curing ink, a Japanese confectionery manufacturer has already adopted a printer that uses *Lunajet* ink for printing its packing materials.

\* VOC-free design

"VOC-free" is defined as emitting less than 700 ppmC (in carbon conversion terms) of volatile organic compounds (VOC) during the printing process.

VOC (volatile organic compound): VOC is a collective term for organic compounds that are volatile and are transformed into gaseous form in the atmosphere. In Japan, VOC emissions are regulated by the revised Air Pollution Control Act.



#### Low-temperature fixing toner

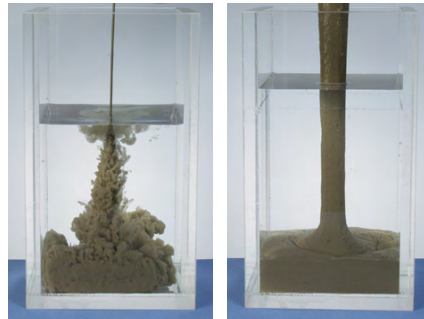
More than half of the electric power used by office photocopiers is consumed in generating heat energy to melt the toner. To reduce the environmental impact of copiers and printers, it is important to develop toner binders that can be melted and fixed at lower temperatures.

Our polyester resin toner binder was developed to meet these requirements. Unlike conventional toners, our new toner uses a polyester resin binder, which can melt at temperatures more than 30°C lower than conventional toners. This toner is highly effective in affixing to paper, and it enables both high-speed printing and energy conservation.

### ***Visco Top* high-performance specialty thickener**

When undertaking civil engineering work near water (for example, on riverbanks or on the coast), it is vitally important that measures are taken to protect the water from being contaminated, so as to prevent deterioration in water quality. In the case of bridge pier construction for long bridges or suspension bridges that cross ocean straits, because the piers are actually built in the riverwater or seawater, special underwater concrete that has high viscosity and is resistant to washout is used. Furthermore, when construction is undertaken near underground watercourses, care must be taken not to contaminate the underground water. For work in this kind of water-related environment, the use of additives to increase the viscosity of inorganic materials such as grouting materials and concrete can enhance underwater anti-washout performance.

We have developed *Visco Top*, a high-performance specialty thickener that provides unprecedented viscosity for grouting materials and concrete, and makes it possible to undertake construction work without causing harm to the riverine or ocean environment. *Visco Top* was used in the removal of high concentration contaminated water from trenches at the Fukushima Daiichi Nuclear Power Plant.



Without the addition of *Visco Top*

With the addition of *Visco Top*



### **Kao's slurry rheological modifier (Product name: *Visco Top*) received the Contribution Award of 50th Ichimura Prize in Industry**

We received the Contribution Award of the 50th Ichimura Prize in Industry, organized by the Ichimura Foundation for New Technology, for our contribution to reducing environmental impact through our slurry rheological modifier development work.

Founded in 1968 to realize the vision of the late Mr. Kiyoshi Ichimura (founder of Ricoh Co., Ltd.), the Ichimura Prize in Industry are awarded to organizations and individuals that have made a major contribution toward the development of outstanding domestic technology in the form of technology development relating to scientific and technological progress, industrial development, cultural advancement, or other areas contributing to the wellbeing and safety of Japan's citizens.



Award ceremony